Vol. III. No. 4. PRICE TEN CENTS.

THE LIBRARY OF CONGRESS, TWO COPIES RECEIVED APR. 11 19 COPYRIGHT ENTRY CLASS XXc. COPY B.

The Automobile

AN ILLUSTRATED MONTHLY JOURNAL.

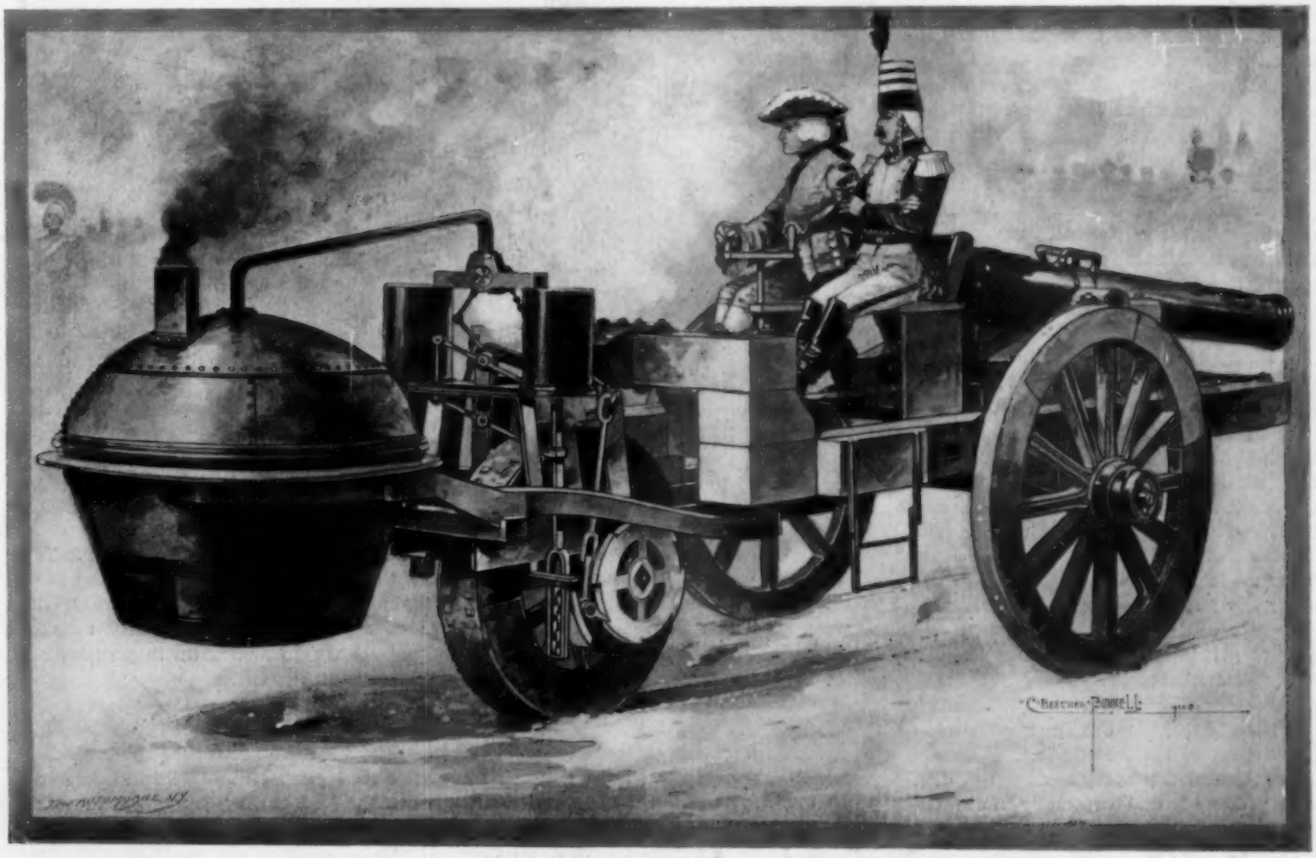
Published at 150 Nassau Street.

NEW YORK, APRIL, 1901.

Copyright, 1901, by The E. L. Powers Co. Entered at New York Post Office as second-class matter.

THE FIRST STEAM AUTOMOBILE.

The illustration below represents what is supposed to have been the first operative automobile ever constructed. It is the steam gun carriage built by the War Office of France in 1769, from the designs of Nicholas Joseph Cugnot, a captain of artillery in the French army. The illustration was prepared from Cugnot's own working drawings, which, with the machine itself, are still in existence, the latter being preserved in the Conservatoire des Arts et Metiers, Paris.



THE CUGNOT STEAM GUN CARRIAGE.

The engine cylinders are single-acting, their lower ends being open, and the piston rods act through chains on pawls, which in turn work the rachet wheels, one on each end of the front axle. The pawls are connected by links to the ends of a walking beam, so that the downward movement of one piston pulls the other up. A trip carried on each of the piston rods throws the cut-off, thereby admitting steam to the opposite cylinder. To reverse the machine, it was proposed to turn the pawls upside down.

The boiler consists of a plain shell of the form shown, with a single flue rising from the fire-box and no circulation of heat around the shell. Its diameter is 63 inches and its height the same. As is perfectly evident to-day, it was utterly inadequate to the task of furnishing steam for an engine of that size, and the machine could not run more than a few hundred feet at a time, when it had to stop and wait for steam. Nevertheless, Cugnot's achievement was so important for his day that the French government granted him a pension of $10 a month till his death, in 1804.

The Waverley Electric Vehicle With Sperry Battery.

By Herbert L. Towle.

As is well understood by those who have to do with them, most storage batteries are rather delicate affairs, which will give excellent service with careful treatment, but will succumb very quickly to overtaxing or abuse. This is more or less true, even of the heavily constructed cells used for stationary purposes, and is much more so of automobile batteries, in which the lead plates are reduced in weight to the greatest practicable degree.

In its essence, the lead storage cell consists of two or more lead plates, connected together in alternate pairs; the alternate plates are coated with peroxide of lead, while the others have a surface of spongy metallic lead, and the whole is immersed in a dilute solution of sulphuric acid. The surfaces of metallic lead act like the zinc in a primary battery, oxidizing as they generate current, while the peroxide, corresponding to the copper or carbon, is partly reduced to metallic lead; and both substances are afterwards converted back to their previous condition by the process of recharging. In the earlier storage cells these surfaces were "formed" on the clean plates, by successively passing a current through the cell in one direction for a short time and then discharging the partly-formed cell through a suitable resistance. Repeated charges and discharges of this character gradually formed the desired coatings from the substance of the plates themselves.

Coatings thus produced, however, are never very thick, and to increase the capacity of the cell per pound of weight it subsequently became the frequent practice to apply one or another salt of lead, usually either sulphate or chloride, in the form of a paste, to the plate, afterwards converting it to the desired form by electrical treatment. To assist in holding this "active material" on the plates, the latter were made with various perforations or other irregularities of surface, into which the paste could be forced, and were then called "grids." Where lightness is especially desired, batteries constructed thus have easily supplanted the older style.

Without going too deeply into the scientific aspect of the matter, it may be said that in practically every storage cell hitherto produced, and especially those employing pasted plates, the continued integrity of the active material and its adhesion to the plates have been a serious problem. The active material undergoes chemical transformation with every charge and discharge, and in the process its density is increased or diminished, and bubbles of gas are liberated in the interior of its structure, which by their expansion tend to loosen and disintegrate the material. As the charging or discharging is more rapid, these destructive forces become more and more serious, and it is no unheard-of thing for whole sections of the material to detach themselves from the grids, or for the grids themselves to warp or buckle under the strain. Again, the mere mechanical vibration of the vehicle's motion tends in the same direction.

Mr. A. E. Schaaf, of the American Bicycle Company, assured the writer that the company had found it next to impossible to transport batteries of the ordinary construction from Indianapolis to New York without injurious loosening of the active materials from the jarring of the train.

Needless to say, inventors have long been endeavoring to overcome this drawback; and by all indications, the new battery, invented by Elmer A. Sperry, of Cleveland, Ohio, and purchased by the American Bicycle Company, is an important step in this direction. Although many details of the preparation of this battery are not yet ready for publication, yet the writer is enabled to give the following particulars, which were kindly furnished him by Mr. Sperry. In brief, the battery elements are constructed by press-welding a mass of finely-divided metallic lead with a small percentage of a neutral binding material, thus producing what for all mechanical purposes is a self-hardening cement, which is then welded to the grid by being subjected to hydraulic pressure, and becomes high tenacity, and very porous, while still not being too brittle for its purpose. The plates thus produced are then "formed" in the usual way, the lead coating of the positive plate being converted into peroxide of lead, while the negative plate remains spongy metallic lead. This is accomplished without weakening the tenacity of the coatings, and the result is a battery which will endure very high rates of discharge, and if necessary, of charging also, and which, by reason of having so large a quantity of active material on each plate, is of somewhat more than double the capacity per pound of weight that has been found practicable in cells of the ordinary construction.

As an example, the Model 21 light Waverley runabout, of which a photograph is shown in this article, is now equipped with twenty cells of Sperry battery as against thirty-six of those previously used, and these weigh about 340 pounds, as against 390 for the old battery. The mileage of the old cells, on dry and level asphalt, was about 25 miles, while the same machine, with the twenty cells of Sperry battery, has shown in practice between 55 and 60 miles.

FIG. 1. WAVERLEY RUNABOUT, MODEL 21.

To still further unite the grid and the active material, Mr. Sperry makes the former with numerous projections like little lead pins, all over its surface, and when the lead coating is applied, the ends of these pins are flattened down, so that they act like little rivets all over its surface. The positive plates, moreover, are tightly wrapped with two or three layers of "peroxoline," a new fabric resembling cheesecloth, produced by a special process, so that it is very flexible and strong, and is insoluble in the acid solution. There are only two of these positive plates, each about 7 by 8 inches, and three negative plates, in each cell of the runabout battery described. Perforated rubber separators are used between the plates, and, to

lessen the effects of mechanical vibration, the latter are cushioned on small steps or feet, of soft rubber, made integral with the cell.

It would seem natural that a battery constructed on the lines above described should be not only of large capacity for its weight, but very durable; and this is, in fact, especially claimed for it. As an instance of this, Mr. Sperry mentioned a set of 44 cells, which, after 2,500 miles of constant service, was found, on examination, to be perfectly intact and with not the slightest detaching of the positive material from the plates.

As the Model 21 carriage is a recent addition to the Waverley line, some further details regarding it may be of interest. The total weight of the machine is about 900 pounds. The motor is rated at two horsepower, with an overload capacity of

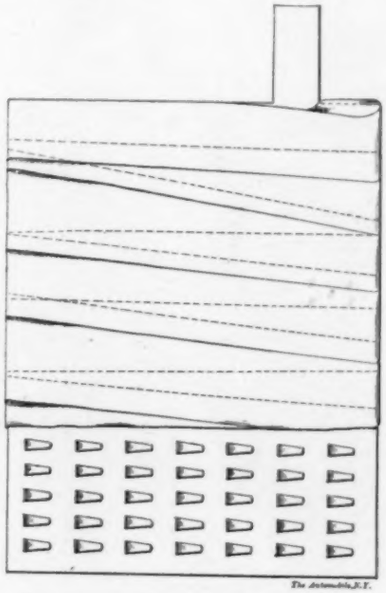


FIG. 2. POSITIVE PLATE, PARTLY WRAPPED.

100 per cent. No reach connections are used between the axles, and the motor, unlike that of the heavier machines, drives directly on to a differential on the rear axle. The wheels are 30 inches in diameter, with 2½-inch G. & J. tires. Five speeds, from four to twenty miles an hour, are obtainable, in either direction. Elliptic springs are used on both axles, but the front ends of the rear springs are linked to the ends of a light flat spring running transversely under the body. The brake acts on the armature shaft, and is double-acting.

As the first set of Sperry batteries arrived in New York rather late in March, the writer regrets that he was unable to make a personal test of their mileage capacity in time for this article, but he hopes to be able to report the results of such a test in an early issue, when they will certainly be of much interest.

An Opinion Regarding Speed Limits.

In view of the very general interest in speed legislation at the present time, a representative of THE AUTOMOBILE recently called on Mr. George F. Chamberlin, late acting president of the A. C. A., for an expression of opinion on this subject. As Mr. Chamberlin is a lawyer and chairman of the law committee of the club, and was largely instrumental in obtaining the presentation of the substitute bill now before the New York Legislature, his opinions on this subject have an especial interest.

"What do you take to be the intent of a law governing the speed of automobiles in country districts, Mr. Chamberlin?" was asked. "That is, is the law to be taken merely as placing the responsibility in case of an accident, or is it expected to be enforced under all conditions, regardless of the presence of other users of the road? In England, you know, they have been putting constables behind the hedges, where they could jump out on anyone who they thought was exceeding the legal limit, and arrest him even if no other soul was in sight."

"Well," Mr. Chamberlin replied, "of course the law is made to be enforced, but after all its intent is simply to protect other users of the road, and I do not believe that any objection would be raised to a motorist running his machine at any speed he thought proper, where there was no possible danger of his interfering with the peace and comfort of others. For instance, in New Jersey and on Long Island there are miles of straightaway macadam roads, with perhaps not a house in two miles, and only occasional teams to be met with. In such a case I cannot see any objection to a burst of high speed, and think that the law would not be invoked unless for spite or prejudice. It is really only the recklessness of the few that makes a speed law necessary."

"Do you consider a speed limit an effective way of regulating the speed in cities?" was asked. "For example, a speed perfectly safe on the boulevards would be very dangerous in the more crowded streets."

"That is true," was the reply, "but in our bill we provide against the imposition of unreasonably low limits by prohibiting the local authorities from enacting a speed limit below eight or ten miles an hour in the built-up portions of cities, or fifteen miles in the parts not built up."

"True; but after all, do you consider a fixed speed limit of any degree the best method of coping with the conditions? Evidently no such limit absolves any driver from the necessity of using due caution. What about relying on reckless driving laws instead of speed limits?"

"There are reckless driving provisions in our bill, which is in the form of an amendment to the existing highway law of this state," replied Mr. Chamberlin, "and these must of course be enforced. At the safe time, the question arises: 'What is reckless driving?' A policeman may swear that a man is going too fast, and he replies that he was going no faster than the trolley cars. It all depends on the magistrate and the testimony of the officer. He may or may not be aware of the superior controllability of the automobile as compared with the horse. It is easy to err as to speed of any vehicle, and there are always many attendant circumstances to be taken into consideration."

"Another view was suggested a while ago by a correspondent in an English contemporary;" and Mr. Chamberlin was shown a copy of "The Autocar," containing the following letter:

"I am really surprised that Mr. ——— should have taken it upon himself to suggest to the Board of Trade that no motor car should be made capable of travelling at more than twelve or fourteen miles an hour. I almost wonder he does not suggest that all horses capable of exceeding that speed should be sent to the knackers.

"Personally, I should have no objection to carrying a number, which seems to me a very reasonable idea (always provided that all vehicles are numbered), but I should most strongly object to being treated as a fool or an irresponsible by having it put out of my power to travel at any pace I, in my judgment, and with the knowledge that I was answerable for the consequences, thought proper.

"But the fact is we are too fussy to leave people alone, and too chicken-hearted to punish them when they break the law. Why, in the name of common sense, can we not tell people that they must not run over their neighbors, and leave them to find out for themselves, at their peril, how not to do it? That is the way to breed up a self-reliant people. "B."

"That is a very sensible letter, indeed," was Mr. Chamberlin's comment, after he had read it. "In a word, it proposes to let the driver alone so long as he keeps out of trouble, and to punish him with adequate severity if he gets into trouble. Personally, I am a strong believer in going back to the plain common law of the road, applicable to drivers of horses and automobiles alike, and requiring simply that each conduct himself with due regard for the comfort and safety of others on the road. I believe that a judicious enforcement of these first principles would build up a body of precedent far more effective in regulating this question of speed than any arbitrary set of speed rules can ever do. I believe, moreover, that it will eventually come to precisely that. At the same time, there is such a fuss made by the public at present, and so many unreasonable bills are being proposed, that it seems to be a choice between a reasonable speed limit, advocated by the Automobile Club of America, and all sorts of unreasonable limits enforced in spite of it. Therefore, at the present time I am in favor of the sort of legislation which the club now advocates."

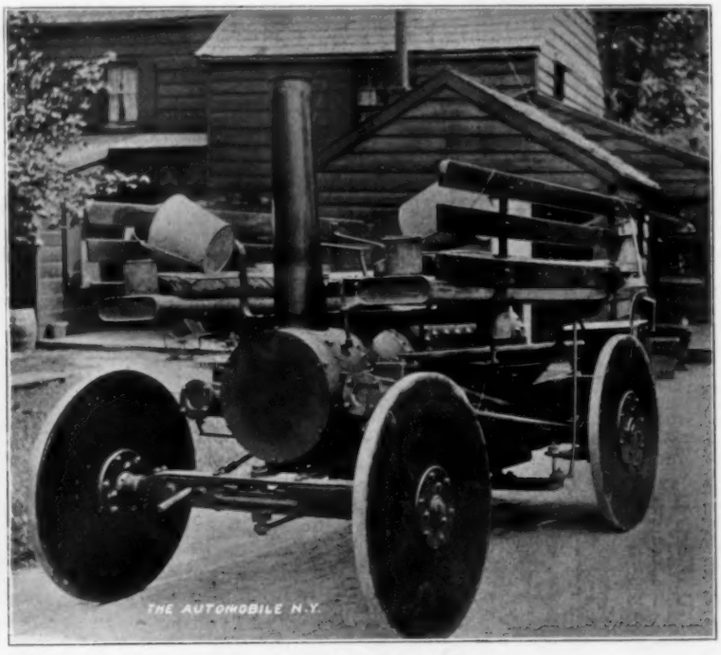
The First American Steam Wagon.*

By Walter S. Funnell.

When it was first attempted to substitute self-contained power in wagons for horse-flesh, steam was the means employed. Very naturally the locomotive, as then used on the steam railroads, was taken as a type, and was copied as far as it was possible to do so. It was, of course, out of the question to attempt to have in a road vehicle as much weight as was contained in the ordinary locomotive, and so efforts were made to improve the means of generating steam so that there would be a saving of space and weight. With these ideas in mind, Richard Dudgeon worked in New York City some forty years ago. Being of inventive turn of mind, and the owner of a large manufacturing establishment, he had the facilities and means for carrying out in practical form his ideas, and it was not many weeks before he had out in the streets of New York a machine that made horses of high temper rear and snort in fear, and even the pedestrians along the streets look on in wonder and with some concern for their personal safety. The apparatus which he made was called a steam wagon, and that is exactly what it was. It was four-wheeled, and had a framework suitable for carrying a steam boiler, with accommodations for eight or ten passengers. The seat cushions were mounted on the long water tanks, extending along the sides of the wagon.

The mechanical arrangements were different in several respects from the then existing locomotives, though the general plan was similar. There were two steam cylinders, one on each side, mounted obliquely, and they were connected directly with the rear axle. The stroke of the engine is sixteen inches, the bore of the cylinders four inches, a very different plan of construction from the modern form. It was Mr. Dudgeon's belief that high pressure was necessary, and his boiler was constructed especially to meet that demand. It was tested to stand a pressure of 250 pounds per square inch. Its water capacity was very small, and intense heat was required to generate and keep up the required steam pressure. All these problems were solved successfully, however, and the Dudgeon steam wagon, the first of its kind, made its appearance on upper Broadway. There it proved such a terror to horses and human beings alike that the police got after it and Mr. Dudgeon was compelled to return to his home with the machine. Many times again he ventured out, and each time he learned something about the contrivance—some fault to be corrected or some good point to be retained.

The public soon learned about the steam wagon, too. One meeting with it was enough for the owner of a lively horse. The steam, exhausting at high pressure, made a terrific noise, and the machine, going along at a lively gait, clanking and clattering, and often belching forth fire and smoke from the short smokestack, was enough to excite attention anywhere and at any time. Mr. Dudgeon soon found that there was less public sentiment to be overcome out in the quiet village of Locust Valley, Long Island, where his country home was situated, than in New York city, so he moved his base of operations to that place. True, the country horses took no more kindly to the hissing, snorting machine than did those of the city, but there were fewer out in the country to be annoyed. So there the steam wagon stayed, with the exception of occasional trips to the city and to Bridgeport.



THE DUDGEON STEAM WAGON.

The original machine was destroyed by fire at the time the Crystal Palace was burned, in New York City. The idea still remained, however, and Mr. Dudgeon very soon built another on almost the same lines and of about the same dimensions. This vehicle is still in the possession of the inventor's son, Frank P. Dudgeon, at Locust Valley, intact in every particular, except the boiler. This has been rebuilt and made slightly larger, and consequently of greater capacity. This improvement was made by the present owner, who, with the exception of the builder, is the only person who has ever driven the vehicle. Inheriting some of his father's love of mechanics, and some of his ability as well, he has come to love the machine as a yachtsman loves his craft, or a rifleman his weapon. Many a wild mile has he ridden with the steam wagon, and friends who have accepted his invitation to take a ride have had thrilling experiences. "Hold your hair on" is an appropriate injunction when one goes a-steamwagoning.

The machine has been tried on the race track, as well as the public highway, but going around the circle or oval is tame play. It is the excitement of dashing around the turns of the country roads or jolting over the uneven grades that gives pleasure to the driver. In the mechanism there is no allowance made for the ride and fall of the centre of gravity. When heavily loaded, so that the springs are pressed down, the adjustment of the steam valves must be different from that when there is no load or the vehicle is "light." So it happens that when the steam wagon goes over a "thank-you-ma'am," or is jarred in any way, the steam is cut off from the cylinders, and "she catches her breath," as Mr. Dudgeon says. Steering is another matter of management that requires skill. This is accomplished by means of a rod connecting with a double-threaded screw passing through a ball which is socketed in the forward axle. By means of this a quarter of a turn of the rod is sufficient to make a considerable variation from a straight course. To know just how much to turn the handle in order to round a curve without upsetting, or to pass another vehicle in the road, is to be possessed of a skill which no living person but Mr. Dudgeon has acquired. The barber at Oyster Bay, into whose shop the steam wagon ran one day, may tell you that even Mr. Dudgeon didn't know how to handle the machine till he learned by experience.

The steam wagon has carried some gay

*A photograph of this machine, with its inventor, Richard Dudgeon, and four companions seated in it, was shown in THE AUTOMOBILE of December, 1900.

parties of pleasure-seekers, but perhaps its gayest days have been spent in Bridgeport, Conn. Some years ago Mr. Dudgeon received a permit from the police to run the machine in the streets of that city, and the steam wagon soon became as well known there as Barnum's circus, and indeed some of the good people of the city wondered which furnished the greater amount of excitement. The steam wagon was a sort of free circus in itself.

A remarkable feature of the steam wagon is the construction of the wheels, which are built of solid red cedar. They are apparently as sound and strong as the day they were completed. They were at first made with narrow tires, and when the present owner began using the machine on dirt roads he thought wide tires would be an improvement. He had broader ones put on over the original ones, which are still in place, but he decided that they made greater resistance, and did not accomplish any useful purpose, so they were discarded. The old machine stands almost as it did originally, and is good for many a spin throughout the country.

The French Government has made it obligatory on all participants in races to carry conspicuous numbers both in front and behind. Speed is reduced in passing through villages, and usually these portions of the course are deducted, with the time consumed in passing them.

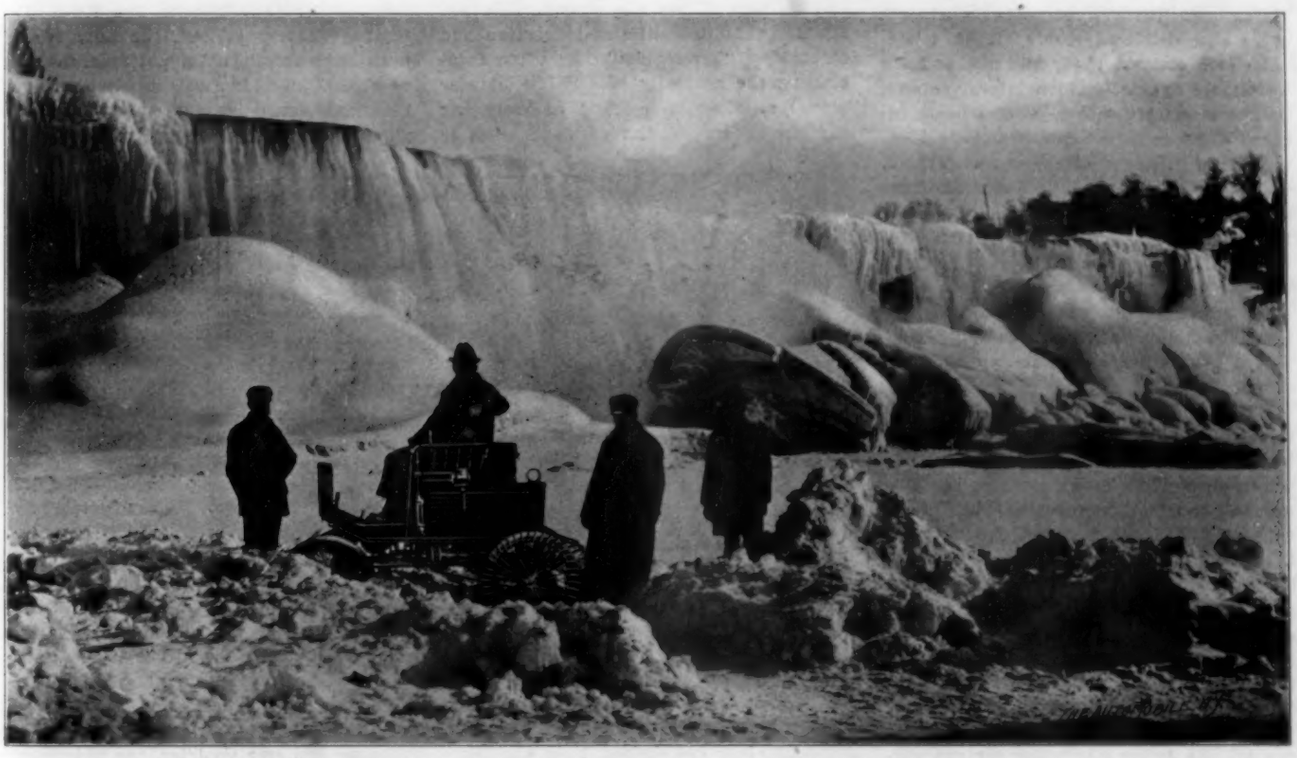
Notes on Running Gear and Design.

By M. C. Krarup.

Given a certain motor and transmission gear, steering gear and brake system, and a well-defined idea of the work for which the automobile is intended, the other dispositions to be made in regard to vehicle frame and running gear, wheels and tires, location of motor mechanism, springs, etc., still involve the possibility of producing any one of a number of different types of automobiles which may vary largely in suitability and attractiveness, efficiency and durability.

Loosely speaking, these dispositions produce the "design" of the vehicle, but the term is poorly chosen if it convey the idea of something relating solely to outward appearance and style. In American automobiles design and construction have so far been almost as inseparable as soul and body. A free, artistic choice in design proper can follow only after the data of construction shall have become comparatively fixed. Until then nothing is irrelevant or a mere matter of taste, unless it be the leather top, the canopy and the tassels thereon.

American builders of automobiles have placed untold restrictions upon their choice of expedients in "constructive design" by bowing too readily and too profoundly to an inexperienced public's supposed aversion to radical departures from horse-carriage styles. And, curiously enough, the two principal deviations which they have allowed themselves in this respect—the old Ackerman steering system (nearly one hundred years old) with pivoted front wheels and the substitution of wire (suspension) wheels for wood (compression) wheels—may prove to be of no particular value and unnecessary. It is easy to perceive, however, what factors have been at work to cause as well the imitation of ordinary carriages as the two exceptions referred to. On one side the makers of carriage parts, bodies, springs, etc., upon whom the first automobile experimentors depended for quick execution of their plans, could furnish material wherewith to build a likeness of a horse carriage very much cheaper than parts of new form, purpose and material. Then it was noticed, also, that horses easily became accustomed to a "horseless" carriage, but not so easily to new and strange contours. Through the officiation of the newspapers and public opinion this consideration of safety for the neighbor and his beast became a factor of strong conservative influence. The wire wheels are probably mostly due to the much vaunted wonderfulness of the bicycle as a "triumph of inventive skill;" and to the same influence may be traced the extensive use of drawn steel tubing in frames and running gears. The art of making neat and strong joints with tubing had advanced to a point of great proficiency; tubing was abundant and relatively cheap; brazing forges were everywhere available.



A "LOCOMOBILE" ON THE ICE BRIDGE BELOW NIAGARA FALLS.

It is difficult to consider these influences seriously as having anything to do with deliberate automobile engineering. They are gradually wearing away under the tooth of experience, and while it is safe to say that tubing will always be used to some extent to resist compressive stresses, it seems equally sure that many special forms of structural steel will be developed to take its place, and, before long, will predominate in every automobile built under the supervision of an engineer capable of estimating stresses and designing forms adapted to resist them. In advanced types of construction there is even now very little tubing used, and wire wheels are far less commonly specified than a year ago. They are more readily injured than wood wheels—though more susceptible of repair, it is true—soon look scarred, rusty and old, and are unreliable against sudden lateral shocks. As the manufacturers of wood wheels became familiar with automobile requirements and skilled in complying with them, wire wheels seem likely to disappear from all business automobiles, unless new forms are evolved that will look well when painted, will be adapted to cleaning by hose (without rusting anywhere) and will not have the spindle-shanked appearance under a heavy carriage that makes the wire wheel of to-day look out of place.

While the influence of a bicycle construction is dwindling, the embargo of horse-carriage-imitation still rests heavily on automobile development. The European constructor usually builds a "chassis," consisting of all the automobile elements; frame, running gear, motor and transmission mechanism, steering and controlling gear. It is an automobile in itself, but without carriage comforts. On top of the rectangular frame of angle irons the carriage portion (the "carosserie") is placed and may be of any design affording seating for the driver and cover for the machinery. If special springs for the carriage portion are needed they are placed in the seat cushions. The advantages of this method have been so much appreciated of late that it is imitated in such prominent American patterns as the "Gasmobile," the "Hydrocar," the product of the Crest Mfg. Co., "Meteor," as well as in Peerless Motorettes and the motorettes made in Brooklyn. The course followed by the distinctively American builder has been less simple and more ambitious. Taking the carriage box of some well-known type, such as phaeton or runabout, as the starting point, he has endeavored to fit the motor, tanks, batteries, cooling coils, muffler, indeed everything that would proclaim the automobile, into its compass, making the carriage work strong enough to act as a frame, and supporting it and its contents by means of ordinary heavy vehicle springs on a running gear comprising a divided rear axle with differential gear and driving sprocket or spur-wheel, the rear vehicle wheels keyed to rear axle, a reach or trussed tube work connecting the two axles, and the steering mechanism actuating the front wheels. The dash or splash board of the ordinary carriage was religiously preserved for a long time, but has lately been remodeled in some patterns to yield service as a compartment for tools and at the same time resemble the hood which covers the motor or the cooling coils in French models. In general this (American) style has been defended on the ground of permitting access to all portions of the motor mechanism by simply removing or unfastening the tailboard, and in fact it has the considerable advantage that it facilitates inspection and caretaking, thereby doubtless often forestalling the necessity of repairs; but for actual repairs the method of mounting the mechanism in the carriage work is

A "PANHARD" IN FRONT OF CHARRON'S STORE.

decidedly less convenient than the European style which permits the carriage portion to be readily and entirely removed. Eventually, however, inspection and caretaking should become normal and repairs exceptional, and it may be difficult to say which method will then present the greater advantage. In steam carriages the high regard for carriage appearances has, in the writer's personal opinion, exerted a pernicious influence. It has made it necessary that the driver should be seated with his back to the boiler, engine, tanks, etc., while the air and steam pressure gauges and water glass should be in front, thereby necessitating comparatively long pipe connections which have proved the source of great trouble in winter weather.

All our steam vehicles and the majority of our gasoline vehicles belong to this school of construction. But exceptions are numerous among the gasoline vehicles. Besides those already mentioned, which are essentially French, the Robinson carriage and the Holyoke carriage present a notable variation in that the motor mechanism, while partly concealed in the carriage portion is mounted on independent acting springs on the running gear frame. This permits the carriage portion to be mounted on easier springs and tends perhaps to prevent the jarring of the motor from reaching the operator and vehicle occupants. On the other hand less material participates in absorbing the vibration and it seems at least doubtful whether vertically-acting springs will not transmit the greater portion of a vibration which is mainly horizontal.

In the Electric Vehicle Co.'s gasoline vehicle, the Olds vehicle, the Knox, the Canda Spider runabout, the Loomis and perhaps in several other patterns, the unity of motor and carriage portions has been abandoned in favor of greater baggage-carrying capacity and perfectly free access to the mechanism. The last is supported on the running gear frame more or less distinctly separate from the carriage which occupies the "second story" of the edifice supported on ordinary light carriage springs. The motor has no other spring support than that provided in form of pneumatic tires. With a low center of gravity to give stability and the advantage of nearly as much carrying-space as in horse vehicles, the objections to this type are principally such as refer to encumbered appearance, difficulties in keeping clean and neat and exposure of motor mechanism to climatic influences. If automobilism shall succeed in supplanting animal traction, there is a strong feeling abroad that the automobiles must satisfy æsthetic demands as well as the demands of the engineer, and the writer for this reason fails to see that the "two-story" type can be accepted as a final solution of the designer's difficulties, even if all needed progress in motors and, especially, power transmission devices materialize and are incorporated in it.

Possibly the solution may be approached gradually by blending the three types or by a radical departure by which an automobile forestructure or rear structure may be coupled to a vehicle structure in a manner so far untried.

Hints on Steam Vehicle Management.—VII.

By George T. Hanchett.

As has been stated in previous sections, steam automobile engines almost without exception use the plain slide valve such as has been described. It is of the highest practical importance that the automobilist know how to set a slide valve. First, because it is of actual value to him in case his vehicle valve gear becomes deranged or injured, thereby necessitating the installation of new parts or the readjustment of old ones. Second, because in all cases where the automobilist must also be a licensed engineer setting of a slide valve is a stock question in case an examination has to be passed.

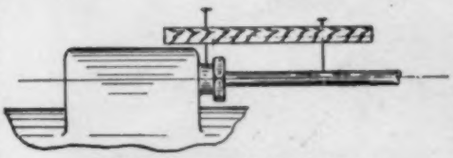
Slide valves are usually set in one of the two ways, either for equal lead or for equal cut-off. By equal lead is meant that the valves shall be open an equal amount on either dead point of the crank, and by equal cut-off is meant that the valve shall cut off the steam admission at the same point in the stroke at both head and crank ends. Setting for equal lead is the most common.

Most automobile engines have two or more cylinders, and it is best to consider each cylinder separately. Similarly it is best to confine the setting to one eccentric, and then, throwing the link over, to repeat the setting with the other eccentric.

In setting a plain slide valve which has been properly designed there are only two adjustments, one the position of the eccentric with reference to the crank, and second the adjustment of the length of the valve rod. The second adjustment is usually made by means of a turnbuckle or similar device; but in some automobile engines no provision is made for this adjustment, the length of the valve rod being fixed, while in still other automobiles the position of the eccentric with reference to the crank is also fixed, and in such cases any setting other than the original setting designed by the manufacturers is not possible. We will assume however that both the eccentric position and the valve rod are adjustable, and proceed in accordance therewith.

To set for equal lead, thrown the link to extreme forward position and set the crank of the engine on a dead centre. Give the eccentric the proper angular advance as nearly as may be estimated, and make the length of the valve spindle such that the valve is open the right amount, usually a very small fraction of the port opening. Move the crank to the other dead point, and if the valve is open the same amount on the other side it is properly set. If, however, the port is open too much or too little, correct half of the difference between the two port openings by changing the length of the valve spindle, and by means of adjusting the eccentric move the valve so as to correct the other half, thus making the lead the same as on the other dead centre. Turn back to the other dead point, and it will probably be found that the lead is still unequal. Correct the difference in the same way as before, half with the valve stem and half by moving the eccentric on the shaft, and repeat until the port opening is the same on either dead point. The port opening may conveniently be measured by means of a sharpened wedge-shaped pine stick, which is thrust into the port and the depth which the valve opening will permit it to go is noted.

To set the valve for equal cut-off, set the crank on a dead point and note the position of the crossheads, that is, the sliding member attached to the end of the



HOW THE TRAM IS USED.

piston rod on the guides. Mark this point and turn to the other dead point and note where the same part of the crosshead comes on the guides as before.

Measuring between these two points gives the stroke. Set the crank on the forward dead point and give the valve the proper forward lead. Move the crank forward and you will notice that the port first opens wider and finally closes. The position of the crosshead at this point of closure should be accurately noted, and the distance of this point from the point at which the crosshead started should be measured. Continue the rotation of the engine until the valve cuts off on the return stroke, and in the same way measure the displacement of the crosshead from the crank end at this point of cut-off; if these two are the same, the valve is properly set. If the cut-off is earlier at the head end than the crank end, the valve spindle is too long, and vice-versa. Let us suppose that the valve spindle is too long. In this case we should first set the engine at the head end dead point, which will give the forward lead. The valve spindle should then be shortened, which will increase the port opening on the dead point, and by reducing the angular advance, the proper port opening may be restored. Try the cut-off again, when an improved result will be noted, and one or two such adjustments should give satisfaction.

It is sometimes inconvenient to remove the cover of the steam chest, and the necessity for this may be avoided in the following way, provided preliminary precautions have been taken. The gland of the valve stem should be screwed up tightly to a metal contact. Then, using the gland face as a guide, trace a mark on the valve stem with a scriber at the moment when the valve is just opening on the head end. Turn the engine over and trace a second mark on the valve stem at the moment when the valve is opening on the crank end. This will locate the position of the valve without the necessity of removing the cover of the valve chest. On the head end the distance between the scratch mark and the face of the gland will show the exact amount that the valve is open. On the crank end, however, the arrangement is not so convenient, for as the valve opens on that side the scratch mark enters the gland, and the distance between it and face of the gland cannot be noted. This trouble may be avoided by the use of a tram, which can be conveniently made by inserting two sharp steel points in a piece of well-seasoned wood so that they can be used as a measure of distance. A centre punch mark is made on the gland and another on the valve stem, which latter mark is located by placing one point of the tram in the mark on the gland and making a light scratch on the stem with the other point at the position of admission at the head end. The engine is then turned over and a second mark is made on the valve stem at the position of crank end admission. The distance of these points from the tram point at all other positions shows the amount the valve is open or closed, and using the preceding directions, the valve can be set for equal lead or cut-off as may be desired. The accompanying sketch shows a convenient shape of tram and its application to the valve rod.

Liquidation of the Illinois Electric Vehicle Transportation Company.

Following a strike among its drivers, the Illinois Electric Vehicle Transportation Co. went into liquidation last month, and will dispose of its assets and distribute the proceeds, amounting to about $2 per share, among the stockholders. The report states that 158,620 shares were issued, from which $793,700 was received in subscriptions. Out of this $50,000 was paid for real estate, and $31,760 in fitting up the property. The total expenditures aggregated $756,890 up to Feb. 1. The operating expenses to the same date came to $265,885, which was $128,778 in excess of the gross receipts. The company had at that time a balance of $173,911 in cash and owned 109 vehicles, but these assets were partially offset by a large loss for depreciation. The bad condition of the streets was given as a reason for suspending business, but the company had been losing money steadily. It was organized in 1899 with a nominal capital of $25,000,000, which a year ago was reduced to $2,500,000.

The Sterling Steam Carriage.

The Empire Mfg. Co., Sterling, Ill., are the builders of the steam carriage shown in the accompanying illustrations. As the woodcut shows, both the boiler and the running gear are out of the ordinary, the latter being a small horizontal water-tube boiler, much on the lines of stationary boilers of the Babcock & Wilcox order, with a steam drum above the tubes and containing also a series of superheating tubes above the drum. The underframe is of channel steel, with a front axle of trussed strap steel swiveled on a horizontal king pin. In the engravings shown the engine, which is of 4½ horsepower with cylinders 2½ by 3½ inches, is carried on the underframe near the right rear wheel, and drives the differential by a pinion and gear. The makers state, however, that they prefer to suspend the engine in the center line of the carriage under the footboard, and drive the rear axle through a chain, as this gives greater flexibility.

FIG. 1. THE STERLING STEAM CARRIAGE.

Instead of using a water column, the gauge cocks are tapped directly into the left head of the boiler, which is accessible through a hinged panel directly covering it. The head itself can readily be taken off through the same panel when it is desired to clean out the tubes, a point in which this boiler has an evident advantage over the shell boiler. The boiler tubes are of steel, and the drums are made from charcoal iron lap-welded boiler tubes.

The exhaust steam after leaving the cylinder is utilized to heat the feed water. The tank capacity is 25 and 5 gallons for water and gasoline, respectively.

Automobile Week at the Pan-American Exposition.

The Automobile Club of America will act in co-operation with the managers of the Pan-American Exposition in arranging the program for an automobile tournament in Buffalo, to begin Sept. 16 and last one week. A committee of automobilists has been appointed for this purpose, to act in connection with the Sports and Athletics Committee of the Exposition. It includes the following gentlemen: Malcom W. Ford, chairman and secretary of the A. C. A.; J. M. Hill, Percy Owen, and S. T. Davis, Jr., representing the electric, gasoline, and steam vehicle interests, respectively, and Dr. Truman J. Martin, president of the Buffalo Automobile Club. The first four are members of the A. C. A., and Mr. Davis is also president of the National Association of Automobile Manufacturers.

The program of the week has not been decided on, but it appears certain that the Buffalo-Erie-Buffalo race will be carried through if the managers of the exposition can accomplish it. At this writing no proposition regarding the race has been received or acted on by the A. C. A. Board of Governors. If the race is held, the exposition managers will undertake to police the route.

The question of insurance is causing a hitch in the arrangements of some of the New York ferry companies to admit gasoline vehicles to their boats. Among these are the Staten Island Rapid Transit Co., the Union Ferry Co., whose boats start from Fulton, Wall and Catherine streets, and the Long Island Railroad Co. The East 23d St., Roosevelt and Grand St. ferries on the East River, and the Pennsylvania, Erie and B. & O. ferries, on the North River, transport all kinds of vehicles.

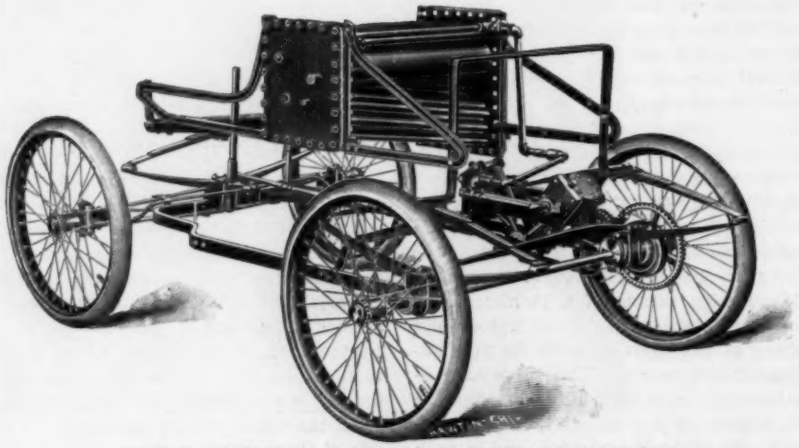


FIG. 2. SKELETON VIEW OF THE STERLING CARRIAGE.

INVITATION RUN OF THE A. C. A.—LUNCH TIME.

An Invitation Run of the A. C. A.

By invitation of Mr. C. J. Field of the De Dion-Bouton Motorette Co., of Brooklyn, N. Y., the initial run this season of the A. C. A. had the newly opened factory of that company for its destination. Twenty-three motor vehicles started from the club quarters at Fifth Ave. and Fifty-eighth St., in Manhattan, shortly after 11 o'clock, March 16, several machines being furnished by the company for the transportation of members whose machines were not conveniently available. The course was down Fifth Ave. to the Twenty-third St. ferry, and thence by way of Prospect Park to the factory. The club was joined on the Brooklyn side by the Long Island Automobile Club. Luncheon was served at the factory, and the two clubs spent an enjoyable afternoon looking over the works, where a large number of machines were seen in all stages of construction.

The "Buckeye" Runabout.

The light gasoline runabout illustrated herewith is built by the People's Automobile Mfg. Co., Cleveland, O. It has a four-cycle single cylinder motor of 2¾ horsepower, with variable speed up to 1,000 r. p. m. and ignition by primary spark. The gasoline tank holds three gallons. There are two forward speeds and one reverse, obtained by a drum transmission gear connected with the engine shaft. A pedal under the left foot operates the low speed gear, and the high speed clutch is controlled by a handle at the driver's right. The weight of the machine complete is said to be 750 pounds.

FIG. 1. THE "BUCKEYE" GASOLINE RUNABOUT.

The Lewis Gasoline Runabout.

The light gasoline machine shown herewith is built by the Lewis Cycle Co., 338 Lewis Ave., Brooklyn, N. Y. It has a twin cylinder motor, of 3½ by 4 inches cylinder dimensions, and developing 4½ horsepower at its normal speed of 750 r. p. m.

FIG. 2. THE LEWIS GASOLINE RUNABOUT.

The F. B. Stearns Gasoline Surrey.

The gasoline surrey illustrated herewith is a recent product of F. B. Stearns & Co., Euclid and Lake View Aves., Cleveland, O. It has an 11-h. p. single-cylinder motor, and is stated to weigh 1,800 lbs. It carries five passengers and has a gasoline capacity for 100 miles. Its long wheel-base is especially noteworthy. The wheel steering is one of the 1901 improvements.

The Mobile Delivery Wagon.

The light steam delivery wagon shown in Fig. 3 on this page is a recent product of the "Mobile" Co. of America, Tarrytown, N Y. A number of wagons of this style have been put in service by one of the New York newspapers for local delivery.

FIG. 3. THE "MOBILE" DELIVERY WAGON.

FIG. 4. THE F. B. STEARNS GASOLINE SURREY.

Alfred C. Harmsworth, the well-known English journalist, has purchased a Locomobile surrey.

The Automobile

Published at
150 NASSAU STREET, NEW YORK,
on the first of each month,
BY THE E. L. POWERS CO.

SUBSCRIPTION PRICE.

North America - - - - - - - - - $1.00
Foreign - - - - - - - - - - - 1.50

Advertising Rates Upon Application.

Address Communications to
THE AUTOMOBILE, 150 Nassau St., New York.

Entered at the N. Y. Post Office as second-class matter.

CONTENTS.

(Copyright, 1901, by The E. L. Powers Co. All rights to signed articles reserved.)

The First Steam Automobile..... 73
The Waverley Electric Vehicle with Sperry Battery. By Herbert L. Towle.....74, 75
An Opinion Regarding Speed Limits..... 75
The First American Steam Wagon. By Walter S. Funnell..... 76
A "Locomobile" on the Ice Bridge Below Niagara Falls 77
Notes on Running Gear and Design. By M. C. Krarup 77, 78
Hints on Steam Vehicle Management—VII. By Geo. T. Hanchett..... 79
Liquidation of the Illinois Electric Vehicle Transportation Co. 79
The Sterling Steam Carriage 80
Automobile Week at the Pan-American Exposition 80
An Invitation Run of the A. C. A..... 81
The "Buckeye" Gasoline Runabout..... 81
The Lewis Gasoline Runabout. 81
The "Mobile" Delivery Wagon 81
The F. B. Stearns Gasoline Surrey..... 81
Editorials 82, 83
Safeguarding the Automobile's Rights.
The Automobile as an Educator.
Speed Regulation in Cities.
A Moral Tale.
Keeping "Logs."
Tire Tendencies.
The Selden Patent Suit..... 83
Grinding Valves 83
Can He Do It?..... 83
Club News and Views 84
Automobile Club of America.
Long Island Automobile Club.
National Capital Automobile Club.
Rhode Island Automobile Club.
Automobile Club of New Bedford.
An English Club Show.
A Speed Law for New York State..... 85
Correspondence 85, 86
The Real "Endurance Test."
The Hazards of Racing. 86
The De Dion-Bouton Vaporizer..... 86
Automobile Demonstrations to Constables and Magistrates. 87
The Industry in France 87
Races in France 87
The 8-HP. Decauville Carriage..... 87
Will Ride Across the Continent..... 88
Electricians Study Autos. 88
To Carry the Pan-American Mails 88
A Cure for "Blowing Back"..... 88
Metallic Bodies and Eastman Carriages..... 88
A New De Dion Model. 88
Notes 88
The Moffett Roller Bearing..... 88
Business News 89
Patents 89, 90
Advertisements.....89, 90, 91, 92, 93, 94, 95, 96

Safeguarding the Automobile's Rights.

At this writing it appears probable that the Doughty substitute speed bill, of which a reprint is given on another page, will pass the New York Legislature without change other than a possible amendment giving Park boards the power to regulate the speed of, but not to exclude, automobiles in their domains. The bill is a long step in advance of what would have been inflicted on the State if it had not been for the efforts of the A. C. A. and the Manufacturers' Association, and the hearty thanks of every automobilist in New York State is due the gentlemen of both bodies who so earnestly and, we trust, successfully worked for its passage. It is not perfect, for the minimum speed limit in towns is needlessly low; if eight miles is safe for a horse, twelve miles is excessively so for a motor carriage. Again, it would have been better, we think, to require that automobiles in the country should slow down to, say, fifteen miles on approaching a crossing or another vehicle, and to have made no limit, or a fairly high one, for general running. But such changes must necessarily wait for an educated public opinion, and the law as it stands is at least a very respectable safeguard.

The Automobile as an Educator.

"The great mechanical educator," some one once called the bicycle; and the word was true, more or less, at the time it was uttered. But the public of to-day has happily been trained up to that level, and the days have gone by when one could pose as a Nestor in things mechanical, because he had dissected his "bike" and put it together again without destroying its usefulness in the act. We are glad to believe that the automobile will assume in the decade now begun the educational eminence left vacant by its humbler predecessor. Herr Teufelsdröckh, no longer content with large speculations on philosophy and clothes, buys a motor carriage; and under so fascinating a teacher we watch without alarm his awakening sense of his benighted condition. We contemplate with equanimity, and even with a serene faith in the good to follow, the tribulations of the chauffeur whose brake bands have burned out through an indiscreet application of resin; and we do not despair of the individual who trusts his gauge glass, like his politics, to Providence, and expects both to be purified without his care. The man who does not know that check valves will leak till a burned boiler acquaints him with the fact has our heartfelt sympathy, but we know that the new gospel of education will be greatly spread by that man.

He who has so far learned to rule his auto that he can take it twenty miles on its own power, with the low-gear clutch broken or slipping, is greater than he that taketh a city; but, after all, he is greater who keeps that clutch in order. The automobilist who condemns ball bearings because his have gone to pieces is wiser than him who knows not ball bearings at all; but the true mechanic is the man who replaces the balls before their surface is worn. For we believe that, granted proper workmanship in a modern machine, full one-half of the troubles most commonly experienced are due to lack of that fine instinct which tells its owner when his machine is in order, and what to do to keep it so, rather than to any lack of ingenuity when the breakdown comes. It is easy—almost too easy—to propose alterations which would prevent a given accident; but it is better to use the brake aright than to spoil it in a day, better to wash out the gauge glass than to clamor for low water alarms, which themselves may fail in their duty; better to keep the check valves clean than to cry out against the machines which use them. Better, too, we might add, to penetrate the mysteries of the storage battery, and get faithful service from it, than to destroy it in one heedless run and then anathematize the tribe. With all our modernity, the homely adage about prevention and cure remains as true as the day it was first uttered; and the man who applies it to his automobile is the one who has learned the automobile's lesson.

Speed Regulation in Cities.

The remarks of Mr. Chamberlin on the subject of speed legislation, on another page of this issue, are worthy of note as a lawyer's opinion given with full knowledge of present-day automobile progress and possibilities. We have from the first regarded an arbitrary speed limit as an exceedingly awkward instrument, admissible only in the absence of a more generally effective check on reckless driving. In the city especially, the range of permissible speeds is so great that no one limit can fit all sections. If it is high enough for the avenues, it is useless in the business sections, and if low enough for the latter it will inevitably be a dead letter on the avenues, or only a nuisance if enforced. A better plan is to have two limits, but to us the most rational method seems to be to make the limit high enough to include all reasonable cases, and supplement it with a strictly-enforced reckless driving ordinance and severe penalties for those causing accidents. This would not be practicable in the country, owing to the general lack of witnesses to establish a case, but this could hardly be so in cities, and a little experience would ensure against unreasonable judgments and arrests. "The common law of the road," as Mr. Chamberlin well said, is after all the fundamental thing to be up-

held, and we shall look long before we hit on a better trick to that end than Horace Greeley's for the resumption of specie payments.

"The way to resume is to resume."

A Moral Tale.

The story is told of a physician whose custom it was to spend his summers in touring, thirty miles a day, in his private caravan, and whose horses, being of the Tory persuasion and averse to new things, could not reconcile themselves to the strange creatures which infested the highways and rushed upon them with growls and snorting. Being himself much averse to disturbing encounters, and of the opinion that the cause of them ought to be condignly suppressed, the doctor one day spoke of his grievance to a motorist. The reply was most suggestive and helpful. "Then, doctor, dear," said his friend, "why the d—l do you use horses?" That put the matter in a fresh light, and a trial of the new locomotion was all that was lacking to effect conversion. The trial soon came, in a machine which on the first encounter had alarmed not only the horses, but their driver as well. Said the doctor after his experience: "I can't say that I didn't enjoy that little spin, but I was astonished to get safely back. We had driven thirty miles in twenty minutes, scared fifteen horses, and returned with a yard or two of a schoolgirl's red frock sticking to the machine." And the next day he was asking prices.

This pleasing tale, whose veracity is so self-evident that we do not need to assure our readers thereof, carries its moral on its face. Granted that, being a man of accurate mind, you are content to do your thirty miles in four times twenty minutes, why should you, behind a flighty beast, continue to play Mrs. Partington when you might so easily go with the tide?

Keeping "Logs."

A correspondent, the owner of a steam carriage, writes us that he makes a point of keeping a detailed log of all his outlays of time and money on his machine. He says: "For instance, I know just how many minutes per day I have worked on my auto; how many minutes of repairing per mile travel; how much per mile the extra parts have cost, and the same of tires, oil and uaphtha. I know also the averages per day, week and month for mileage, oil, gasoline, work, new parts, tools, care, etc. Not a cent is spent on the auto or in consequence of the same without being recorded." To just what extent one man's experience in repairs would be useful to another man will depend largely on the make of the machine and the sort of attention given it. But the fuel consumption, the mileage and the time spent in cleaning cannot but interest everyone operating the same type of machine, and much on these points could be learned by a free interchange of opinions, through the press and otherwise.

Tire Tendencies.

Indications point to the increasing use in this country of the double-tube tires similar to those which hold exclusive sway abroad. The single-tube tire is more affected by a puncture than the double-tube, and to counteract this so far as possible it is the practice to make them of considerable thickness. This minimizes the puncturing, but at considerable cost as regards resiliency and yielding quality when running over small obstacles in the road. Double-tube tires of modern forms are fully as easy to repair as the single-tube tires, and the greater satisfaction in their use is easily worth the difference in price.

The Selden Patent Suit.

The Winton Motor Carriage Co., and the Buffalo Gasoline Motor Co., defendants in the suit of the Electric Vehicle Co. and Geo. B. Selden to test the validity of the Selden patent, have filed their answer to the claims made by the plaintiffs. This answer includes a list of forty-six United States patents, dating from May 25, 1844, fifty-three British patents, dating back to 1794, together with seventeen citations from the French Patent Office, beginning with 1807, in all of which the defendants claim that the substantial features of Selden's alleged invention were anticipated. In addition to these citations a general denial is entered as to the validity of the patent. Among others, the following points are made or claimed:

That the alleged invention is wholly inoperative and was never used, by the plaintiffs or by anyone else. That the plaintiffs suffered no pecuniary loss by reason of the alleged infringement of the patent by other makers. That the long delay between the first application for the patent and the issuance thereof was purposely contrived by Selden to circumvent the law. That after the patent had been allowed, in May, 1895, Selden made alterations in the terms of the claims as allowed, representing that these changes were immaterial, whereas in reality they greatly broadened the claims; and that by reason of this fraudulent alteration the patent is illegal and void. That the alleged invention contained in fact no patentable novelty, and that various persons had known and made use of his alleged inventions before the date of application for the patent.

The defendants, therefore, deny that the plaintiffs are entitled to any injunction, damages, or any other relief.

Grinding Valves.

The exhaust valves of air-cooled motors of more than 2 h. p. easily become rough, especially if the valve head is of steel. The compression of the motor becomes bad, and the valve has to be ground. In the first place, be careful to mark the valve that has to be ground. Remove the cap, split pin, and spring. Take some No. 000 powdered emery and make a paste of is by mixing it with some gasoline; oil should not be used to make the emery paste, as this makes the work of grinding more laborious and gives less satisfactory results. Put some of the paste on the part of the valve bearing on the seat, place the valve on the seat, and by means of a screw-driver blade fastened in a drill crank turn back and forth, being careful not to press too hard on the crank, especially in the beginning. Lift the valve every now and then with the left hand, and do not stop grinding until the emery does not cut any more. Clean the seat and the valve; put on some more of the paste, and recommence the operation until the roughness has completely disappeared. The surface thus obtained should be quite uniform, but not shiny.

If during the grinding one presses too hard on the valve, as I have often seen done, the emery, instead of acting on the whole surface, is forced into certain places. Part of the valve seat becomes free from emery, and we then have two metallic surfaces rubbing one against the other. The seat, which is of cast iron, is the harder, and one may soon see a circular line of high polish appearing on the valve, which gradually broadens up, and finally disappears. Another part of the valve, either higher or lower, succeeds this one in a little while, and also disappears, the faster the greater pressure. The same effects are constantly reproduced as long as one keeps on grinding in this way. After some time it may be found that the value stem abuts against the lifting lever. The stem has then to be filed to obtain the necessary play between the stem and the lever. The thickness of the valves is also reduced, and may be diminished to such a point as to be unable to obviate the escape of the charge on compression. —A. Oulion in La Locomotion Automobile.

Can He Do It?

As a result of a dispute between M. Charron, the well-known French automobilist, and Herr Canello, of the Canello-Durkopp Co., regarding the relative merits of French and German automobiles, the latter has undertaken to build in three months a 70-h. p. machine to weight not over 1,200 kilogs (2,650 lbs.) and capable of a speed of 120 kilom. (74½ miles) per hour. In the event of his failure he is to pay a forfeit of 10,000 francs, while Charron will forfeit the same if the vehicle is a success.

CLUB NEWS AND VIEWS

Club Directory.

Automobile Club of America, Malcolm W. Ford, Secy., 203 Broadway, New York.

Automobile Club of Baltimore, W. W. Donaldson, Secy., 872 Park Ave., Baltimore.

Automobile Club of Bridgeport, F. W. Bolande, Secy., 49 Cannon St., Bridgeport, Conn.

Automobile Club of Brooklyn, C. Benton Dix, Secy., Hotel Clarendon, Brooklyn, N. Y.

Automobile Club of Columbus, C. M. Chittenden, Sec., Broad St., Columbus, O.

Automobile Club of New England, Geo. E. McQueston, Secy., Brookline, Mass.

Automobile Club of Rochester, Fredk. Sager, Secy., 66 East Ave., Rochester, N. Y.

Buffalo Automobile Club, Ellicott Evans, Secy., Lenox Hotel, Buffalo, N. Y.

Chicago Automobile Club, H. M. Brinckerhoff, Secy., Monadnock Block, Chicago.

Cleveland Automobile Club, L. H. Rogers, Secy., Cleveland, O.

Columbia College Automobile Club. Lewis Iselin, Secy., Col. College, New York.

Indiana Automobile Club, August Habich, Secy., Indianapolis.

Long Island Automobile Club, C. W. Spurr, Jr., Secy., 552 State St., Brooklyn.

Massachusetts Automobile Club, L. E. Knott, Secy., Ashburton Pl., Boston.

New Bedford Automobile Club, E. G. Watson, Secy., New Bedford, Mass.

New Jersey Automobile Club, Dr. H. Power, Secy., Upper Montclair, N. J.

North Jersey Automobile Club, E. T. Bell, Jr., Secy., Paterson, N. J.

Philadelphia Automobile Club, Frank C. Lewin, Secy., Hotel Flanders, Phila., Pa.

Pennsylvania Automobile Club, H. J. Johnson, Secy., 138 N. Broad St., Philadelphia.

Rhode Island Automobile Club, F. A. Fletcher, Secy., 42 So. Water St., Providence.

San Francisco Automobile Club, B. L. Ryder, Secy., San Francisco, Cal.

Worcester Automobile Club, H. E. Sheiland, Secy., Worcester, Mass.

Automobile Club of America.

The Automobile Club of America listened to an interesting talk by Mr. C. J. Field, on March 12th, on the operation and care of gasoline automobiles. On the 26th, Mr. A. L. Riker spoke on the care of electric vehicles. The talks, which were in the nature of "house warmings" for the club's new quarters at 753 Fifth Ave., were informal and were well attended.

The annual subscription dinner of the Club will be held at the Waldorf-Astoria Thursday, April 18, at 8 P. M. Guests may be invited and members are requested to notify the secretary of their intention to attend, before April 10.

The following club runs for the spring of 1901 have been arranged:

March 30—Westchester County Club.
April 13—Ardsley-on-Hudson.
April 27—Babylon, L. I.
May 11—Hopatcong.
May 18—Morris Park (if arrangements can be made).
May 25—New Haven, Conn.
June 8—Tuxedo, N. Y.

Long Island Automobile Club.

On Wednesday, March 13, the Long Island Automobile Club listened to a very interesting talk by Mr. Frank E. Towle, Jr., C. E., describing his experience with a Locomobile surrey and his methods of caring for the same. As readers of the February issue will remember, Mr. Towle has driven his machine 2,500 miles with almost no expense for repairs.

The course for the 100-mile endurance contest on Long Island will follow a winding route from town to town in Queens and Nassau counties, and will at no point be more than thirty miles from Brooklyn. The roads are all good and with no excessive gradients. The exact route was determined on by Messrs. Adams, Pardington, Webb, Fullerton and Chapin in a two day's run, March 22-23. Starting at the Town Hall, Jamaica, it runs north to the fountain in Flatbush, thence southwest to Murray Hill, and through the following towns in the order named: Bayside, Little Neck, Great Neck, Glen Head, Locust Valley, Oyster Bay, south to East Norwich, Jericho, Massapequa, Freeport, northwest to Hempstead, Mineola, Lakeville, Valley Stream, Queens and finishing at Jamaica. Colored flags will mark all turns. The date of the test will probably be April 20.

National Capital Automobile Club.

The following have been elected officers of the National Capital Automobile Club: President, Gen. Nelson A. Miles; vice-presidents, F. C. Stevens, Congressman J. C. Sibley and Clarence F. Norment; secretary, W. J. Foss; treasurer, Dr. J. A. Aspinwall; board of governors, Col. Henry A. May, Dr. Flint, Hon. Davis Elkins, Rev. Dr. Prescott and Clarence Moore. Lieut. Ward of the navy will be elected one of the vice-presidents at the next regular meeting.

Until suitable quarters can be selected the club will meet in Gen. Miles' office.

Rhode Island Automobile Club.

The Rhode Island Automobile Club is considering the subject of a meet at Narragansett Park, and the matter will soon be brought up before the club. Late in the spring another meet will be held at the Hillsgrove Track, which will be open to anyone owning an automobile or motocycle.

Automobile Club of New Bedford.

An automobile club has been organized in New Bedford, Mass., with the following officers: President, R. S. Taber; vice-president, E. A. Wheaton; secretary, E. G. Watson; treasurer, E. W. Russell; captain, Dr. A. L. Shockley.

An English Club Show.

The annual show of the Automobile Club of Great Britain and Ireland will be held in Agricultural Hall, Islington, London, from May 4th to 11th. The number of exhibiting concerns will be well over one hundred, and will include every manufacturer of consequence in Great Britain, together with many agencies for foreign machines, among which appear the Locomobile Company of America and numerous French names. In the exposition line it will certainly be the event of the year in England.

It is reported that a number of automobile clubs throughout the country will organize runs from their respective cities to Buffalo next fall, being scheduled to arrive in the latter city during the automobile week in September. Runs of this sort from Chicago, Detroit, Toledo, Cleveland and Pittsburg, and also from Hartford and Boston, are mentioned as among the probabilities.

Dr. J. Grant Lyman, whose Panhard machine was described in these pages last November, appears by recent developments to have been involved in several financial schemes of a decidedly questionable character. The International Zinc Co., of Joplin, Mo., promoted by him, is on the brink of collapse, and press advices indicate that this is only the latest of numerous similar enterprises of his. His whereabout at this writing is unknown.

Dr. Lyman was recently elected to the A. C. A., but it is a safe guess that the club's membership roll will soon be minus his name.

No less than twenty inventors have filed interfering applications for patents on automatic safety devices for automobiles, whereby the machine is stopped by unseating of the driver. The patent office has divided the contest under seven heads, making seven interference cases to be adjusted before the patents can be allowed.

A Speed Law for New York State.

The speed bill prepared by the Automobile Club of America, and substituted by Assemblyman Doughty in the New York Legislature for the original bill bearing his name, passed the Assembly on March 26 by a vote of 80 to 26, after a hard fight from the Park Department. The text of the bill is as follows:

Section 1. Sections one hundred and sixty-two and one hundred and sixty-three of chapter five hundred and eighty-eight of the laws of 1890, entitled "An act in relation to highways, constituting chapter nineteen of the general laws," are hereby amended to read, respectively, as follows:

Sec. 162. Term "carriage" defined.—The term "carriage" as used in this article shall be construed to include stage coaches, wagons, carts, sleighs, sleds, automobiles or motor vehicles, and every other carriage or vehicle used for the transportation of persons and goods, or either of them, and bicycles, tricycles, and all other vehicles propelled by manumotive or pedomotive power, or by electricity, steam, gasoline, or other source of energy.

Sec. 163. Entitled to free use of highways.—The commissioners, trustees or other authorities having charge or control of any highway, public street, parkway, driveway or place, shall have no power or authority to pass, enforce or maintain any ordinance, rule or regulation by which any person using a bicycle or tricycle, an automobile or motor vehicle, whether the same be propelled by steam, gasolene, electricity or other source of energy, shall be excluded or prohibited from the free use of any highway, public street, avenue, roadway, driveway, parkway, or place, at any time when the same is open to the free use of persons having and using other pleasure carriages, except upon such driveway, speedway or road as has been expressly set apart by law for the exclusive use of horses and light carriages. The Municipal Assembly, or Common Council of a city, may adopt ordinances limiting the speed of automobiles or motor vehicles upon the streets of such city, and the Board of Supervisors of any county may adopt ordinances regulating the speed of automobiles or motor vehicles on the highways or streets of such county, outside the limits of cities. No ordinance, rule or regulation adopted by the authorities of any municipality in pursuance of this section or of any other law, shall require an automobile or motor vehicle to travel at a slower rate of speed than eight miles per hour, within any city, town or village of the State in the built up portions thereof, nor at a slower speed than fifteen miles per hour where the same are not built up. An ordinance adopted by a Board of Supervisors in pursuance to this section, regulating the rate of speed of automobiles or motor vehicles on the highways or streets of such county outside of cities, shall supersede any such ordinance in such county adopted by the authorities of a town or village. But nothing herein shall prevent the passage, enforcement or maintenance of any regulation, ordinance or rule, regulating the use of bicycles or tricycles in highways, public streets, driveways, parkways and places, in such manner as to limit and determine the proper rate of speed with which such vehicles may be propelled, nor in such manner as to require, direct or prohibit the use of bells, lamps and other appurtenances, nor to prohibit the use of any vehicle upon that part of the highway, street or parkway, commonly known as the footpath or sidewalk.

Sec. 2. Article six of such chapter is hereby amended by adding thereto the following sections:

Sec. 166. Registration by owners of Automobiles.—Every owner of an automobile or motor vehicle shall, within thirty days after the amendment to this section takes effect, file in the office of the Secretary of State a statement of his name and address, with a brief description of the character of such vehicle, and shall pay to the Secretary of State a registration fee of $1. The Secretary of State shall issue to such person a certificate stating that he has registered in accordance with this section, and shall cause the names of such persons to be entered in alphabetical order in a book kept for such purpose. Every person hereafter acquiring an automobile or motor vehicle shall, within ten days after acquiring the same, register with the Secretary of State as required by this section. This section shall not apply to a person manufacturing or dealing in automobiles or motor vehicles, except those for his own private use.

Sec. 167. Use of Highways by Automobiles.—Every person driving or in charge of an automobile or motor vehicle on any street, avenue, parkway or driveway in this State shall not drive the same at any speed greater than is reasonable and proper, having regard to the traffic and use of the highway, or so as to endanger the life or limb of any person.

Sec. 168. Brakes and Lamps on Automobiles.—Every automobile or motor vehicle shall be provided with good and efficient brakes, and shall also be provided with a suitable bell, horn or other signal. Every automobile or similar motor vehicle shall be so constructed as to exhibit during the period from one hour after sunset to one hour before sunrise two lamps showing white lights visible within a reasonable distance in the direction toward which the automobile is proceeding, and shall also exhibit a red light visible in the reverse direction. The lamps shall be so placed as to be free from obstruction to light from other parts of said automobile or motor vehicle.

Sec. 169. Stop Automobile on Signal.—Every person driving an automobile or motor vehicle shall at request or signal by putting up the hand, from a person driving or riding a restive horse or horses, or driving domestic animals, cause the automobile to immediately stop and to remain stationary so long as may be necessary to allow said horses or domestic animals to pass. This provision shall apply to automobiles going either in the same or in an opposite direction.

Sec. 169A. Licenses or Permits for Automobiles.—Any person owning or operating an automobile or motor vehicle, whether the motive power of the same be electricity, steam, gasolene or other source of energy, except such as are used for public hacks, trucks or other vehicles for hire, shall not be required to obtain any license or permit pursuant to the provisions of any local or municipal resolution or ordinance, or the rules or regulations of any commissioners, trustees, supervisors or other authorities having charge or control of any highway, public street, parkway, driveway or place, or pursuant to the provisions of any municipal charter or any other statute, except as herein contained. Every such automobile or motor vehicle shall have the separate initials of the owner's name placed upon the back thereof in a conspicuous place, the letters forming such initials to be at least three inches in height.

Sec. 169B. Penalties.—The penalty for violating any of the provisions of section one hundred and sixty-three or sections one hundred and sixty-six to one hundred and sixty-nine-A, both inclusive, relating to automobiles or motor vehicles propelled by electricity, steam, gasolene or other source of energy, shall be not exceeding twenty-five dollars.

The Doughty bill has been substituted in the Senate for a nearly similar bill there introduced by Senator Cocks as a substitute for his original bill. It is expected to pass.

The Mikado of Japan was lately presented by some of his countrymen in this country with a Woods electric victoria, in which he may now be seen riding around the streets of Tokio.

Correspondence.

Space will be given on this page to letters concerning the Automobile, its operation or construction, to accounts of tours or runs, routes of travel, good roads, etc. When requested by correspondents their names will not be published, but must always be given in the communication to the Editor.

The Real "Endurance Test."

Editor THE AUTOMOBILE:

I notice that there are to be several "endurance tests" this spring for automobiles. I take little stock in such exhibitions, for my experience shows that almost any make of carriage can be made to run from 50 to 100 miles without much trouble. At the end of such trips, however, there are usually extensive repairs necessary. What is needed by practical men is a carriage that will be in condition to be used every day from 10 to 50 miles. I do not think great speed is called for, but users certainly do want endurance for weeks, instead of for one day's test. I have spent a great amount of time looking at different makes of carriages, and the information I have gained is that in the minds of the builders every vehicle made will go on forever, like the brook, with no attention except oiling and cleaning. There cannot be an accident unless the driver is very careless. That's what the builders say. Users talk differently.

Most of the makers glibly converse about the superior finish of their vehicles, freedom from noise, odor and vibration. All that is very nice, but it is easy enough to build a carriage possessing those fine points, and yet that will not run any time. What we owners desire is a vehicle that will go ahead whenever we turn the lever. Personally, I do not much care if there is vibration, noise and smell, provided the wheels keep turning. And the finely polished body of the carriage will get tarnished if machinists have to work over it every day. Shining machinery also soon gets dingy from mud, water and oil

Generally the builders show a carriage on a smooth floor, where it will run without vibration. What I want is to have a carriage roll down the pike several hours going over cobblestone pavements, across rails, through mud, sand and gullies. A hundred miles of that work is pretty near a real test of endurance. There are few vehicles that will complete a test of that sort without needing attention before going out again. And we users must give such a test almost every time we ride.

I have had a gasoline carriage nearly a year, and I often run long distances, but after every trip I usually call a machinist to fix something. For instance, March 17, I ran 50 miles, and the next day I found teeth pulled out of the differential gear and the steering gear was bent. The batteries were also run out. Before starting I tried to fix the bent steering gear, and in doing so broke two bolts that had

been subjected to great strain. I tied up with wire, and ran about town until I found a machinist, who fitted in new bolts hurriedly. I made the trip, although I couldn't turn a corner unless it was very wide, because the wheels would move only a little ways. I made the run of 50 miles without looking at a thing, and came home at fast speed, even though the battery did miss fire occasionally. I knew the battery was old, so that if it had given out I should not have complained.

I can carry gasoline enough to run 125 miles, and I do not doubt that my carriage would cover 100 miles without making a single stop if I prepared for the test. Yet, even though I should cover such a distance I would not crow any over the performance, for I am certain that I should have to make repairs before going out again, for that has been my experience. Therefore, I do not see what good such tests are for practical work. A real test would be to devote a week to the trial, and have the carriages run at least 25 miles every day at usual speed and over the variety of roads found in city and country, giving just the work expected by owners. The carriage that came through in good shape would be entitled to a blue ribbon. I have horses and carriages that I have used day after day for months, without accident or repairs. Automobiles must be able to do the same thing before they can be considered really serviceable. A horse that was sick or lame after every trip would soon be discarded, and a carriage that was out of order most of the time would be disposed of. The high prices charged for automobiles and the independent attitude of the builders do not make users tolerant of gross defects in both material and work. And that is the great evil of the business—builders find themselves flooded with orders because their capacity is generally limited, and they throw together a few old things, covered with varnish, making an automobile that will perhaps wheeze and gasp around the track a few times without shedding wheels or bolts. "Great thing!" shouts the maker. "It cost to build $300; charge $1,500 for it." And the purchaser, who may not know a gear from a bar of soap, pays spot cash—and then his hair grows gray with the trouble that follows. The builder says the carriage was all right when delivered, and proceeds to charge all the trouble to inexperience.

In spite of the many troubles met with, automobiles are rapidly increasing in Massachusetts. The last time I was out, March 17, I met ten carriages in going 40 miles. All were steam, and three were laid up alongside the road for repairs. I pushed by all of the steam vehicles at a speed of 20 miles an hour. My machine made more noise than the smooth-running steamers, but I did not have to stop for water or gasoline or to pump air.

I am anxiously waiting for the "perfect" machine, for when the automobile does run it is a great joy. I intend to keep on trying experiments until I find something that will really take the place of horses in all seasons.

Robin Damon.

Salem, Mass., Mar. 18.

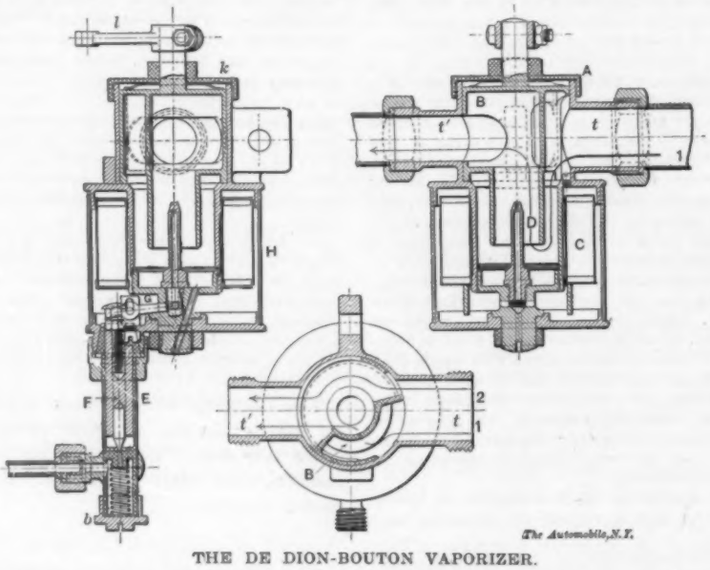
The Hazards of Racing.

The illustration here reproduced from La France Automobile shows what a slip in steering can do to a 3,000-pound machine running forty miles an hour. The machine in question was a 28 horsepower Daimler of 1900 model, belonging to W. K. Thorn, president of the Automobile Club Bearnais, and the accident occurred during the race at Pau on Sunday, Feb 16. Mr. Thorn, who is an American, was driving at full speed when he came to a bend which was hidden by a line of trees. On turning he found the road blocked by a stranded autocar on one side and by a cab immediately in front of him. He tried to squeeze through between the cab and the edge of the road, but instead of that went down the bank, when the car turned completely over. The mechanician escaped with a few bruises, while Mr. Thorn was fortunate in getting off with a dislocated shoulder.

THE HAZARDS OF RACING.

The De Dion-Bouton Vaporizer.

The accompanying drawings give sectional views of one of the several styles of vaporizers used by De Dion, Bouton & Co. It is intended to regulate by a single movement the relative proportions of air drawn directly past the spraying nozzle and the pure air which subsequently mixes with the carburetted air; and to do this without reducing the total air supply or disturbing the gasoline duct or nozzle. In the figure the arrows 1 and 2 show the course of the two streams of air. Stream 1 passes downward, then up past the nozzle, drawing gasoline with it, and at t' is joined by the supplementary stream 2. The two streams are divided by a cylindrical valve B, which seats on its outer bottom edge and is turned by the lever l.



THE DE DION-BOUTON VAPORIZER.

Other parts are as follows: A, bronze body, with the connections t t', and with a hole drilled in the bottom to drain off waste gasoline and prevent flooding; C,

annular float surrounding the mixing chamber; D, brass nozzle; E, tube surrounding the grooved valve F, which is acted on by the float lever G, and in whose lower end a needle point of nickel opens or closes the gasoline inlet; H, float tank. The screw cap b holds in place a spring on whose upper end is a wire gauze strainer. An advantage of the annular float is that the distance between the gasoline level in the chamber and the nozzle orifice is not affected by tipping of the vaporizer.—Illustrations redrawn from La France Automobile.

Automobile Demonstrations to Constables and Magistrates.

A number of automobilists in London lately combined forces to give a practical demonstration of the manageability of their machines to chief constables from numerous counties in England. This demonstration took the form of a run from the Whitehall Court to the Club quarters with the chief constables aboard as their guests. At the club the subject of local regulation was fully discussed, and the majority of the chief constables expressed themselves as greatly impressed with the absolute security of the machines in competent hands.

The favorable impression thus produced among those whose duty it was to enforce the laws was unfortunately largely offset by the refusal of those who made the laws—the county councillors—to meet the automobilists in their several counties for the same purpose. Invitations were extended by the automobilists in Kent, East Suffolk, Essex, and others, to the members of the county councils to participate with them in runs, but for the most part these came to nothing through the non-appearance of the lawmakers.

The Industry in France.

The following statistics have recently been given showing the magnitude of the industry in France:

The capital actually invested approximates $4,000,000.

About 10,000 workmen are directly employed in the industry.

Some 100 firms are manufacturing automobiles on a commercial basis.

The estimated yearly output is 1,500 cars and voiturettes and 4,000 motocycles, valued at nearly $200,000.

The automobiles exported from France in 1900 were valued at $66,000.

The following are statistics of the leading firms:

Name of firm.	Area works, metres.	Yearly output, vehicles.	Workmen.	Capital (francs.)
Panhard et Levassor	8,000	300	500	5,000,000
Peugeot	8,000	350	500	.....
Mors	3,000	100	60	2,000,000
De Dion	14,000	400	..	.....
	(3,200 motor vehicles.)			
	Cars.			
Richard	4,000	150	..	3,000,000
Dietrich	4,400	150	..	2,000,000
Clement	14,000	...	500	.....

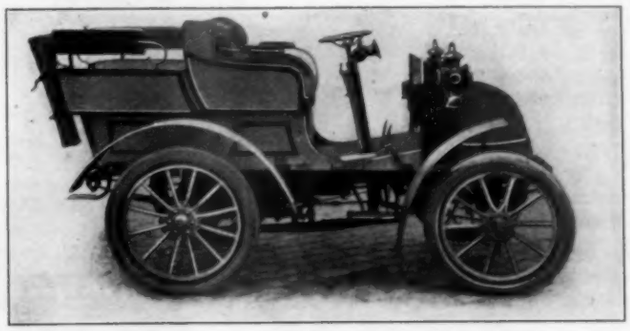


FIG. 1. THE 8-H. P. DECAUVILLE CARRIAGE.

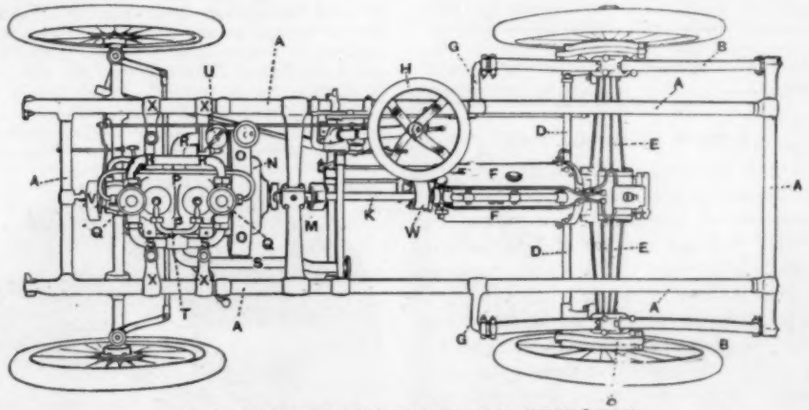


FIG. 2.—PLAN OF THE FRAME AND MECHANISM.

A A A A A A rectangular frame of large section tube, B B springs carrying frame on rear axle, C C clamp brakes on driving wheels, D D rocking shaft applying the two rear brakes, E E driving axle case, F F gear chamber, G G brackets to take forward ends of rear springs, H steering wheel, I steering column, K gear or countershaft, L case enclosing universal joint uniting gearshaft and clutchshaft, M inverted arch bracket carrying clutchshaft bearing, N clutch, O O flywheel, P P engine, Q Q induction valve chambers, with exhaust valves beneath, R R R induction pipes, S S S exhaust pipe, T water circulation pipes leading heated water from top of cylinders to pump, U carburetter, V pinion pump for water circulation driven off the engine-shaft, W block brake on gearshaft applied by clutch pedal, X X X X frame brackets carrying motor.

The four 50-horsepower Napier machines which are being built in England for the Gordon-Bennett international cup race are reported to develop over 70 horse power on the brake. The performance of these enormous machines will be awaited with no small interest.

Races in France.

It is planned to run races for vehicles of all classes over the Paris-Bordeaux course on the day of the international race for the Gordon-Bennett cup, the Gordon-Bennett racers to start first, at about 3:30 A. M., and the slower machines to be started later in classes according to their weight and character of service.

After the Gordon-Bennett race, the most notable racing event of the season will be the Paris-Berlin race, under the auspices of the Paris and Berlin automobile clubs. This was to have been held in May, but is postponed to July 4th to 6th.

The 8-H. P. Decauville Carriage.

The machine here shown, which was put on the market a few months ago by the Société Décauville, as the latest of their line of light vehicles, is an excellent example of modern French practice. Its general arrangement is readily followed from the outline plan. The frame is of large section tubing, stiffly trussed in its forward half. The engine has two vertical cylinders, 3.5 inch bore by 4.6 inch stroke, and runs nominally from 900 to 1,000 r. p. m. A governor prevents over-running by holding the exhaust valves open. Cooling is accomplished by four radiating tubes, bent in an arch over the motor bonnet just in front of the dash. A cone clutch in the flywheel rim transmits the power, through a short shaft K with universal joints, to the speed-changing gears in the case F. These gears are similar in action to those of the Panhard, and the countershaft, as it may be called, drives the differential on the rear axle by a bevel pinion meshing with a bevel gear on the differential drum. There are four forward speeds and one reverse. A pedal disengages the clutch and applies a twin block brake W to the transmission shaft and two other brakes, C C, act on the rear wheels, being applied by a hand lever. A practical feature of interest in the engine is that the inlet valves are wholly contained in a sleeve, which can be increased without taking down any of the piping.

The Automobile Club of Great Britain and Ireland has abandoned its project of holding a 1,200-mile tour or endurance test, similar to the 1,000-mile tour of last year. The obstinacy of the local authorities in regard to the matter of speed limits had a good deal to do with this. It is probable that an Irish tour in August will be substituted.

Will Ride Across the Continent.

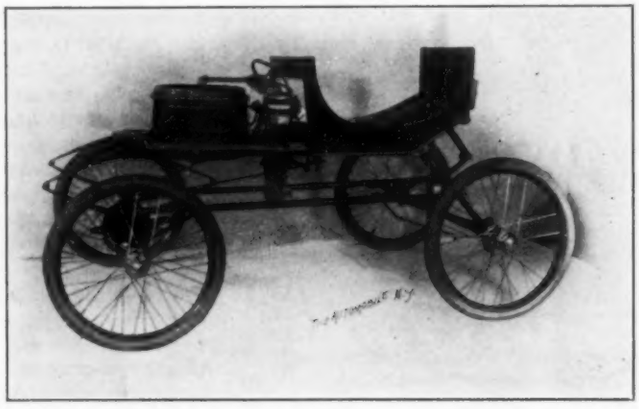
It is announced that Alexander Winton has accepted a proposition to undertake a transcontinental journey from San Francisco to New York. Although no details have been arranged it is expected that the machine will soon be shipped from Cleveland, and that Mr. Winton will start on his journey about May 1.

Electricians Study Autos.

The New York Electrical Society was the guest of the New York Electric Vehicle Transportation Co. at its last meeting. Mr. G. Herbert Condict, superintendent of the company, talked on "Electric Vehicles in New York City," and following the talk the society was shown all through the company's new station.

To Carry the Pan-American Mails.

The contract has just been awarded by the Second Assistant Postmaster-General to the Electric Vehicle Co. for carrying the mails between the Pan-American Exposition grounds and the Buffalo postoffice. The vehicle to be used is the Mark XI. delivery wagon made by the Electric Vehicle Co. It has a carrying capacity of 1,000 pounds besides the driver and attendant and will be required to cover sixty miles a day.



The same company has an order for a wagon of the same type for use in distributing books from the Congressional Library at Washington.

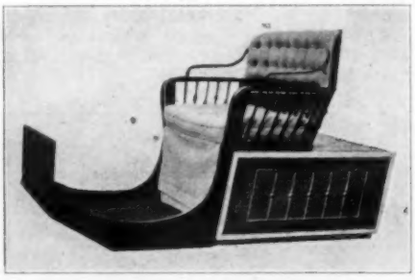
A Cure for "Blowing Back."

An excellent suggestion for the cure of "blowing back" in steam carriages using cross draft is made by a correspondent in a recent issue of "The Autocar." He writes: "I cut out two circular pieces of thin sheet steel about one-half inch larger in diameter than the cross funnel, and attached three legs of quarter-inch by eighth-inch flat steel to each piece; they each had the appearance of a miniature three-legged round table. The legs I made to spring tightly into each end of the cross funnel, into which they were pushed, to leave a space of about one inch between ends of funnel and 'table top.' The owner says the fire has not blown out since these were fitted."

Mr. Leo Stern, whose wife is Susanna Adams, of the Maurice Grau Opera Company, has purchased a Locomobile, which he will take abroad this summer.

Metallic Bodies and Eastman Carriages.

The accompanying illustrations show the steam carriage built by the Eastman Automobile Co., Cleveland, O., and one style of the metallic body built by the same concern. These bodies are made wholly of metal except the seat, and are lined with asbestos millboard. They are made with either spindle, plain, or wicker panels, and will fit the Eastman Locomobile No. 2, Mobile and Milwaukee runabouts.



A New De Dion Model.

A new machine at the De Dion-Bouton Mortorette Co's works is a 5-horsepower motorette of the parent company's 1901 model. It has a number of new features, including a new variety of vaporizer in which the atomizing part is discarded for a species of surface carburation. Another feature is the use of plain bearings throughout, the company's experience with ball bearings having led to the conclusion that they do not pay for the trouble of keeping them in order. The Brooklyn company manufactures all parts of its machines with the exception of the motors and vaporizers, which are imported as heretofore. The company states that its capacity is now eight to ten machines per week.

The Automobile Exchange & Storage Co., 133-139 W. 38th St., New York, has taken the New York agencies for the Century steam carriages and the F. B. Stearns gasoline machines.

Notes.

Mr. Chas. T. Yerkes, the well-known Chicago street railway magnate, has entirely given up the use of horses, and has now equipped his stable throughout with electric carriages, all of which were built by the Woods Motor Vehicle Co.

William Barclay Parsons, chief engineer of the New York Rapid Transit Commission, uses a "Locomobile" in his inspection of the Rapid Transit tunnel work. He as to cover a great deal of ground, and finds a motor carriage a great time-saver.

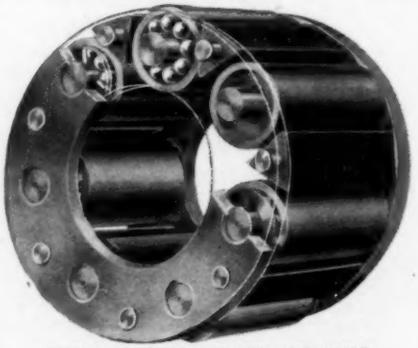
An effort was made last month by Congress to impose a tax of $2 per annum on all automobiles in the District of Columbia and to compel all such vehicles to carry conspicuous numbers for identification. The attempt fell through, but there is likelihood of its being taken up again later.

The Olds Motor Works, Detroit, Mich., were destroyed by fire last month, with a loss estimated at $60,000, covered by insurance. The company will rebuild immediately to rush the work on its "Oldsmobiles," and is already at work in temporary quarters. Fortunately, the automobile patterns and a large quantity of material were saved.

The Moffett Roller Bearing.

The roller bearing illustrated herewith has just been put on the market by the Moffett Vehicle Bearing Co., Chicago. As the illustration shows, the bearing is of unusual construction, the rollers having the form of large hardened sleeves each about one-half the diameter of the axle. Short spindles extend through the rollers into the cage rings, and the rollers are recessed at each end to carry balls which keep them in alignment. Sliding friction of any sort is thus absolutely eliminated. When used in wheel hubs, each wheel has two of these bearings, and they may be adapted to either Sarven or metal hub wheels.

The company states that some exhaustive tests of the load-carrying capacity of these bearings, made in co-operation with Prof. C. V. Kerr, of the Armour Institute of Technology, showed that for a shaft 2¾ inches in diameter, under loads up to 6,000 pounds, the frictional resistance of the roller bearing was under 1-20 as much as with a carefully scraped brass bearing with copious lubrication. The roller bearings were not lubricated except at the start to wet the surfaces. The company states that these bearings have been successfully applied to all classes of service up to gondola cars carrying 100,000 pounds.



THE MOFFETT ROLLER BEARING.

The "Wheel Within Wheel."

A novel form of elastic wheel, which is claimed to be an efficient substitute for the pneumatic-tired wheel at much less cost, is shown in the accompanying illustration. It consists of an inner wheel with suspension spokes, and an outer wheel with metal compression spokes passing through slots in the rim of the inner wheel to a separate hub inside of the hub to which the wire spokes are connected. These two hubs —the inner and the outer— are connected in such a manner that the outer or visible hub, which is driven by the axle, imparts the driving force to the floating hub within it, which is yet free to yield an inch or more when the outer rim strikes an obstruction in the road. The two wheels are held normally concentric by a pair of light bicycle pneumatic tires which are held, one on each side of the central plane, between the rim of the inner wheel and a second rim made fast to the spokes of the outer wheel. As the load on these tires is distributed over a large surface, the air pressure is only about 20 lbs., and it is claimed that the pneumatic action under these conditions is substantially equivalent to that of the usual tire at the periphery of the wheel. The standard sizes are from 28 to 42 inches, and for automobiles solid-rubber tires are fitted to the outer rim. The makers of the wheel are the Wheel Within Wheel Co., Paterson, N. J.

THE "WHEEL WITHIN WHEEL."

The Harvard Auto Co.

The Harvard Auto Co., Boston, will soon open a spacious storage and repair house at 41 to 45 Columbus Ave., at which every possible convenience will be provided for the care of privately-owned vehicles. Offices, waiting rooms and lockers will occupy the front of the building, and in the rear will be stalls for the storage of a large number of vehicles. Washing stands, recharging stands, and a repair shop complete the building. It is intended to make this the first of a series of stables in the larger cities of New England, which will be operated in conjunction so that those who use the Boston stable can enjoy the facilities of the others when on tour, without additional expense.

Business News.

The Kidder Motor Vehicle Co., New Haven, Conn., is fitting up a salesroom at 314 Boylston St., Boston.

Ralph Temple has opened a new store at 293-295 Wabash Ave., Chicago, in which he will carry a large line of automobiles and sundries.

The Munger Vehicle Tire Co., New Brunswick, N. J., are sending out a catalogue of the different styles of Munger non-collapsible pneumatic tires for motor vehicles.

The De Dion-Bouton Motorette Co., of Brooklyn, has discontinued its Philadelphia agency, formerly under the management of Mr. Maurice Loeb, 304 N. Broad St.

By a stenographer's error, the capacity of the water tank, in the account of the Loomis delivery wagon last month, was given as 4 gallons, whereas it should have been 14.

The Automobile Company of America has issued a new edition of its catalogue describing the "Gasmobile." Some fresh illustrations have been added showing the improved model of 1901.

Mr. Maurice Loeb, of Philadelphia, has sold his business to the Quaker City Automobile Co.

The Moffett Vehicle Bearing Co., 86-90 Ohio St., Chicago, has issued a pamphlet with illustrations and sectional drawings showing the Moffett roller bearing applied to vehicle wheels of different kinds.

The New Bedford agency for the E. R. Thomas Co. has been taken by Hoyland Smith, Union Street.

The Toledo Automobile Co., Toledo, O., has been incorporated under Ohio laws to do a retail and renting business. It is desirous of obtaining agencies for first-class manufacturers.

The American Automobile Agency, 903 Witherspoon Bldg., Philadelphia, has issued a booklet setting forth the various lines of its activity, which include stabling, buying and selling, and instructing the novice.

Mr. Joseph J. Mandery, proprietor of the Rochester Automobile Co., is sending a souvenir automatic matchsafe to his customers. It is made of nickel, and the sides bear the advertisement of "Locomobiles," for which Mr. Mandery is distributing agent. The souvenir is both unique and useful.

Joseph H. McDuffee, who will be remembered for his grade climbing feats at the automobile show in Madison Square Garden, has associated himself with Wm. E. Metzger, Detroit, Mich. Mr. Metzger is territorial representative for the Mobile steam carriage, the Waverly electric, and the Olds gasoline machine.

The De Dion-Bouton Motorette Co. has reduced its prices on the smaller sizes of De Dion air-cooled motors. The 1¾ horse-power motor will be sold for $125 instead of $150, this including all working accessories. This motor develops its power at a normal speed of 2,000 r.p.m. It is light and not too powerful for efficient bicycle service. The 2¼ horse-power air-cooled motor will be sold for $150 instead of $200 with accessories. It is adapted for tricycles, racing bicycles, etc.

The contract has been let for a five-story automobile depot in Boston, on Stanhope St., near Trinity place Station. When completed it will be a finely equipped building with 5,500 square feet of space on each floor, and every convenience for the accommodation of patrons—ladies' waiting rooms, reading and lounging rooms, baths, etc.—will be provided. The second and third floors will be divided into offices for manufacturers' agents, and an effort will be made to rent club suites on the upper floors and provide storage for members' machines.

The new establishment will be conducted by P. C. Lewis, the president and manager of the "Automobile Headquarters" at 33 Stanhope St.

Patents.

668,439—Automobile Boiler. Issued to M. H. Detrick.
668,262—Vehicle Motor. Issued to D. N. Melvin.
668,218—Vehicle Motor. Issued to G. L. Roby.
668,769—Automobile. Issued to J. Break.
668,639—Vehicle, Motor Road. Issued to J. F. Hadley.
669,317—Carbureter. Issued to D. J. Brown.

The Aster Motor

in France is surprising the natives, and the natives of France are well versed in automobilism. Records upon records are testifying to the superiority of this gasoline motor.

Reasonable sense and sensible reason furnished in folder form.

WALTHAM MFG. CO.
WALTHAM, MASS.

We Believe It—

because the **Orient Runabout** tells us so. We're glad we have the exclusive agency for America because combined with Orient construction it makes a **"Distinctive Type."**

669,309—Carbureter. Issued to Lane & Davenport.

669,408—Carbureter for Petroleum Motors. Issued to De Dion & Bouton.

669,133—Vehicle Driving Gear, Motor. Issued to F. C. Avery.

669,585—Hub and Axle Motor Vehicle. Issued to A. Krastin.

669,822—Vehicle Motor. Issued to T. B. Dooley.

669,557—Vehicle Motor. Issued to A. L. Stevens.

669,962—Vehicle Steering Mechanism Motor. Issued to H. F. Shaw.

669,653—Vehicle Means for Attaching Motors to. Issued to W. W. Morse.

669,663—Vehicles Transmitting and Steering Mechanism for Motor. Issued to A. Riegel.

Books for Automobilists

Sent post-paid on receipt of price by
THE AUTOMOBILE,
150 Nassau Street, New York.

The Electric Automobile:
Its construction, care and operation.
By C. E. WOODS, E. E., M. E.
12mo., 268 pages, illustrated. Price, $1.25.
Should be in the hands of every user or owner of an Electric Automobile.

Catalogue of electrical books for the asking.
THE AUTOMOBILE, 150 Nassau St., New York.

Automobile Bargains

We have a choice selection of steam, gasoline and electric automobiles in fine condition, at prices ranging from $400 up.
Send for our price list before purchasing elsewhere. DuBois' Automobile Agency,
220 Broadway, New York

No Torch

necessary when you have a Dangler Generator. It automatically lights burner and permits carriage to stand without much waste. On exhibition at
DuBOIS' AUTOMOBILE AGENCY
220 Broadway, New York City

FOR SALE.

FOR $600.—Will sell new side steer "Locomobile." Reason for selling is that I own a double and single machine and wish to sell the single. Address, J. E. T. Bowden, Jacksonville, Fla.

WILL EXCHANGE LOCOMOBILE in good condition for De Dion-Bouton motorette or some other type of gasoline carriage. Address, Advertiser, care The Automobile, 150 Nassau St., N. Y.

IT "GETS THERE" AND IT GETS BACK, TOO.

The "Hasbrouck" Gasoline Carriage

Will climb a 25 per cent. grade.

SILENT ODORLESS PERFECTLY BALANCED

The Hasbrouck Motor Co., Piermont, N. Y.

THE LIFE OF AN AUTOMOBILE.

The easy working of the parts and the comfort of the driver
Largely Depends Upon Perfect Lubrication.

Dixon's Pure Flake Graphite Is the only lubricant that can withstand the heat in a gas-engine cylinder. Pure flake graphite perfectly lubricates motor cylinders and all working parts. We prepare Special Lubricants for Gears of Electric Motors and Special Lubricants for Chains of Motor Vehicles. *Correspondence solicited.* Samples free to responsible parties.

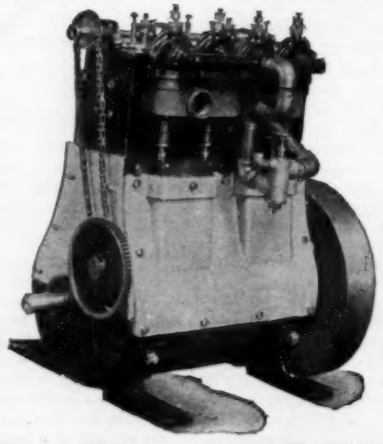
JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.

6½ B. H. P.

Four-Cylinder Vehicle Engine

150 to 1500 Revolutions per Minute

Non-Vibrating Positive Ignition



Type A. Vertical Type B. Horizontal

Sold under a guarantee
Write for Prices and Description

Motor Vehicle Power Company
1227 Spring Garden St., Philadelphia, Pa.
New York Office, 62 Gold St.

Automobile Exchange and Storage Co.

133, 135, 137 & 139 West 38th Street, New York.
Two Doors West of Broadway

Unsurpassed Storage for Automobiles

Repairs promptly executed by our skilled staff of mechanics.
Expert advice given to intending purchasers of Gasoline, Steam or Electric Carriages.

SOLE AGENTS FOR THE SALE OF
F. B. Stearns & Co.'s Gasoline Carriages and Century Motor Vehicle Co.'s Chainless Steam Carriages.

All Points of Excellence

They are combined in the construction and design of the

Winton Motor Carriage

It is the result of *brain labor* and the leader of automobiles. Finish is handsome and durable. Motor is simple and easily understood. Speed as fast or slow as desired.

Carriages and Delivery Wagons

The Winton Motor Carriage Co.

489 Belden St., CLEVELAND, OHIO

JAMES RUSSELL LOWELL SAYS:

"That exquisite something called Style, which, like the the grace of perfect breeding, everywhere pervasive and nowhere emphatic, makes itself felt by the skill with which it effaces itself, and masters us at last with a sense of indefinable completeness.—*James Russell Lowell.*

If you have seen a

National Automobile

you can appreciate the pointedness of this remark.

And as far as mechanical construction is concerned they are positively as perfect as 20th Century brains, best material and all modern machinery in a new factory can make them.

Send 10 cents in stamps for the "Auto Book,"

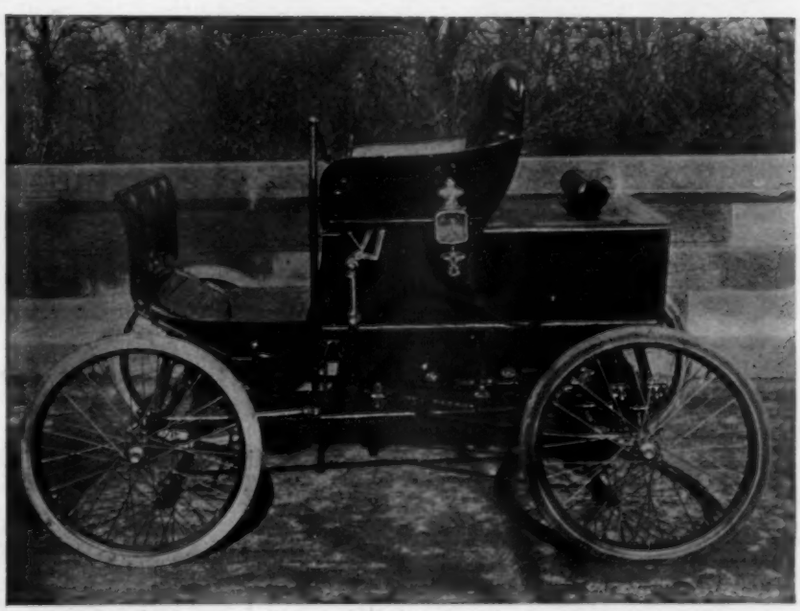
the handsomest and most complete work ever published on the subject of Automobiles.

NATIONAL AUTOMOBILE & ELECTRIC CO.
1005 E. 22ND ST., INDIANAPOLIS, INDIANA.

"READING" STEAM CARRIAGE

STRONG! SPEEDY!

Every desirable feature in a Steam Carriage has been covered. 32-gallon Water Capacity; 8-gallon Gasoline; 30-inch Wheels; Side or Centre Steering; Long Wheel Base; Proper Lubrication; 60 feet Heating Surface in Boiler.



SAFE! SIMPLE!

Gasoline controlled from Seat.

Auxiliary Throttle; Auxiliary Hand Pump; Adequate Engine Water Pump; Pilot Light; Flexible Running Gear; Automatic Fire Control.

Weight charged, 950 lbs.

PRICE, - - - $800.00

THE STEAM VEHICLE CO. OF AMERICA, 253 Broadway, New York

London Agent, JOHN L. SARDY, Saracen Chambers, Snow Hill, London, E. C.

The Oldsmobile

is a marvel to most people

It is only a simple fact however

Runs 40 miles on one gallon of gasoline

Starts at will from seat. Fully guaranteed

OLDS MOTOR WORKS 55 Concord Ave. Detroit, Mich.

American Patent Automobile Gauges

AND POP SAFETY VALVES

Simple
Accurate
Durable

Used by all the leading Automobile manufacturers of the United States and Foreign Countries.

Absolutely Guaranteed

Write for Catalogues and Discounts

Single Steam Gauge — Duplex Style Steam and Air — Single Air Gauge

Manufactured by **American Steam Gauge and Valve Mfg. Co.**, Boston, New York, Chicago.

Steam Steam Steam

Engines, Boilers,

and Fittings. A complete line including Automatics, Gauges, Pin Valves, Safety Glass Gauges, etc., etc.

SEND FOR CATALOG.

Locke Regulator Co., Salem, Mass.

A FREE BOOKLET

Valuable to all interested in Gas or Gasoline Engines

Full descriptions of the best methods of ignition in this class of motors.

Describes apparatus best adapted for use in connection with automobiles.

Send for a copy. It may save you much annoyance and expense.

The Holtzer-Cabot Electric Co.
BOSTON (Brookline), Mass.

THE AUTOCAR CO.
MFGS.
HIGH GRADE
GASOLINE AUTOMOBILES
ARDMORE, PA.

Revere Drop Forge Co.

Manufacturers ...of... **Drop Forgings**

of Every Description.

Send Models or Drawings.
Estimates will be cheerfully given.

BROADWAY, near Fenno's Corner

CHAS. ROBERTSON.
THOS. V. SARGENT.

Revere, Mass.

Automobile and Coach Lamps

of every description

Write for catalogue and prices

THE STEVENS & SACKETT CO.
New Haven, Conn.

Portable Rheostats

which enable you to charge your storage batteries from any Edison station or trolley station, while touring.

Also equipments for private stables and for charging stables.

The Cutler-Hammer Mfg. Co.
Westfield, N. J.

Voltmeters

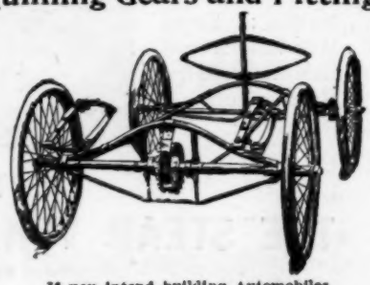
for testing storage batteries.

Volt-Ammeters

for testing primary batteries. Indispensible for ascertaining the condition of batteries.

L. M. PIGNOLET, 78 Cortlandt St., N. Y.

Running Gears and Fittings



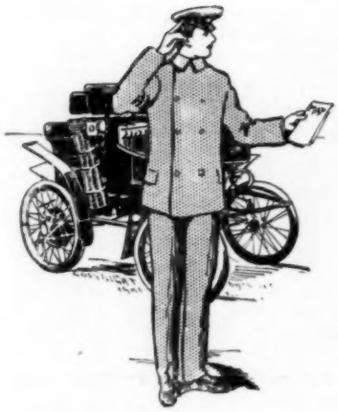
If you intend building Automobiles
Write for our descriptive circular....

A. W. Dolfini & Co., 322 Classon Av., Brooklyn, N.Y.

JUMP SPARK COIL

the BEST gas engine igniter. Acknowledged to be the most up-to-date method.

Electrical Specialties.



How to dress your chauffeur.

How to dress yourself, when in an automobile.

What it costs.

Ask us.

Rogers, Peet & Company,

258, 569, 1260 Broadway, New York.

Electric Power—Lundell Motors

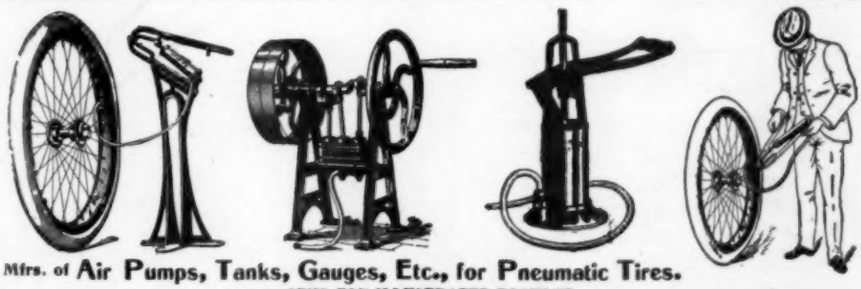
FOR AUTOMOBILES

The Lundell Octagon Motors give an automobile service of the highest order. They are the simplest, safest and most desirable from all standpoints. These motors are designed especially for electric vehicles and are fully described in our Bulletin No. 20417. Send for a copy.

SPRAGUE ELECTRIC COMPANY

NEW YORK.

CHICAGO. BOSTON. ST. LOUIS. BALTIMORE.



Mfrs. of **Air Pumps, Tanks, Gauges, Etc., for Pneumatic Tires.**

SEND FOR ILLUSTRATED BOOKLET.

Gleason-Peters Air Pump Co., 181-189 Mercer Street, New York, N. Y.

Seamless Steel Boiler and Tanks

Patent Pilot Light holding Steam indefinitely. Brake holding either forward or backwark. Water Indicator on Tank. Cut-off at Steam Chest. Leather Dash instead of Wood. Acetylene Lamps instead of Oil or Candle.

The Milwaukee

Stanhope,	$ 750
Surrey,	1,000
Delivery Wagon,	1,000

Milwaukee Automobile Co.

MILWAUKEE, WIS.

De Dion-Bouton Motorette Company

Sole United States Agents and Licensed Manufacturers for DE DION-BOUTON CO. of France

Our Surrey supplies the growing demand for a family motorette to seat three or four. It combines **elegance** and **comfort** with **power** enough to attain high speeds and to climb steep grades.

Write for further particulars to

DE DION-BOUTON MOTORETTE CO.

Church Lane and 37th St., Brooklyn, New York

147 Michigan Ave., Chicago, Ill. Pasadena, Cal.

Indianapolis, Indiana, 112 N. Pennsylvania Street.

Phineas Jones & Co.

Reputation International

All Kinds of Wood Wheels

For Automobiles

Established 1855 **Kelly Springfield Tire Used.** **Newark, N. J.**

SOMETHING NEW

The Columbia Lubricants Co. are offering the only complete line of

Automobile Lubricants

that has ever been put on the market. Nothing gives automobile users more trouble than lubrication.

The oils and greases which we offer for Electric Gasolene and Steam Automobiles are all specially adapted and their use will obviate all trouble in the matter of lubrication.

Write us for more information if you are interested in getting the best results from your carriage.

Columbia Lubricants Co.

22 Burling Slip, New York City

Dietz Automobile Lamp

No wind affects its burning.
No jarring will extinguish it.
Its flame is clear white, and devoid of smoke or odor.
It burns ordinary kerosene (coal oil).
It holds sufficient oil to burn twenty-four hours.
It represents the experience gained in 60 years of Lamp Building.

Read the letter which a practical test of the **Dietz Automobile Lamp** brought forth:

Cleveland, Ohio, U.S.A., Dec. 12, 1900.

R. E. DIETZ CO., 60 Laight St., New York City.

Gentlemen: I am in receipt of your favor of the 8th, and being exceedingly busy I trust you will pardon me for not writing before.

I desire to say that I have used your lamps for a number of months on my carriage, and have found nothing that equals them. On my recent trip to New York I was obliged to drive in the evening, and I can say that your lamps, notwithstanding the extremely rough roads, never failed me, whereas an acetylene gas lamp I had on my carriage proved to be utterly useless for hard driving. I can cheerfully recommend your lamp for all automobile purposes.

Yours very truly,
ALEXANDER WINTON,
President The Winton Motor Carriage Co.

The trip Mr. Winton refers to is his great record-breaking one from Cleveland, O., to the Automobile Exhibition in New York City in November, 1900. 838 miles in 21½ hours.

R. E. DIETZ COMPANY, 60 Laight Street, NEW YORK CITY

Established 1840

DIAMOND TIRES

D D

ARE

RELIABLE TIRES

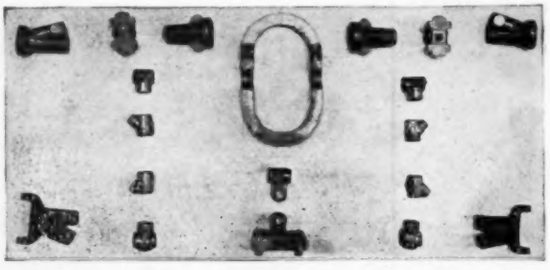
AUTOMOBILES
BIKE WAGONS
BICYCLES

The Diamond Rubber Co.

Factories, AKRON, O.

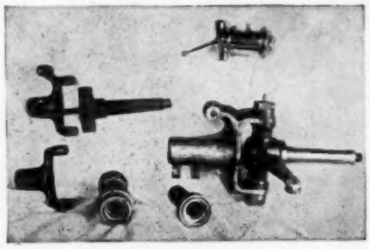
BRANCHES.

218 West 53rd Street,	New York City
7½ Appleton Street,	Boston, Mass.
431 Wabash Avenue,	Chicago, Ill.
9 W. Seneca Street,	Buffalo, N. Y.
435 N. Broad Street,	Philadelphia, Pa.



GEARS GEARS GEARS

We are now prepared to furnish promptly light running gears complete, also frame fittings in the rough and machined



THE CONRAD MOTOR CARRIAGE COMPANY

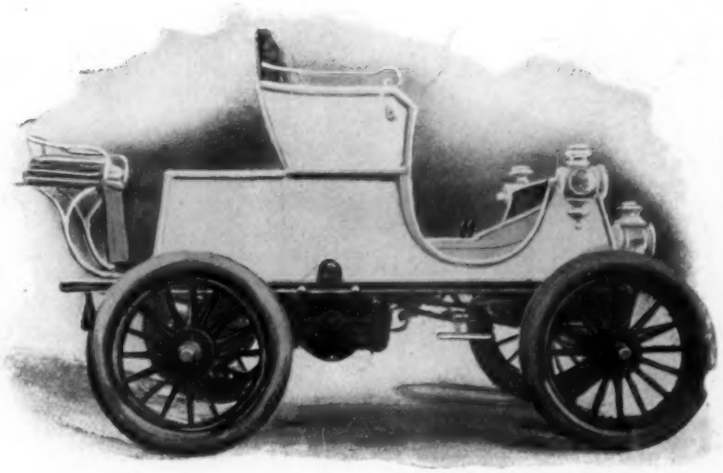
DeWitt & Bradley Sts., Buffalo, N. Y.

GASMOBILE

The Finest Road Carriage Built in America.

First Prize Winner of all Contests for Gasoline Vehicles at the Automobile Club's Show, Madison Square Garden, November, 1900.

Winner of First Prizes and Silver Cup at the Philadelphia Club Show, February, 1901.



Winner of First and Second Prizes to American-made Gasoline Machines at Guttenberg, N. J., September 19, 1901.

Pronounced by Newport the handsomest Carriage of the Season.

Automobile Company of America

FACTORY
Marion, Jersey City, N. J.

New York Office: 32 Broadway

Highest Award Automobile Bearings Paris, 1900

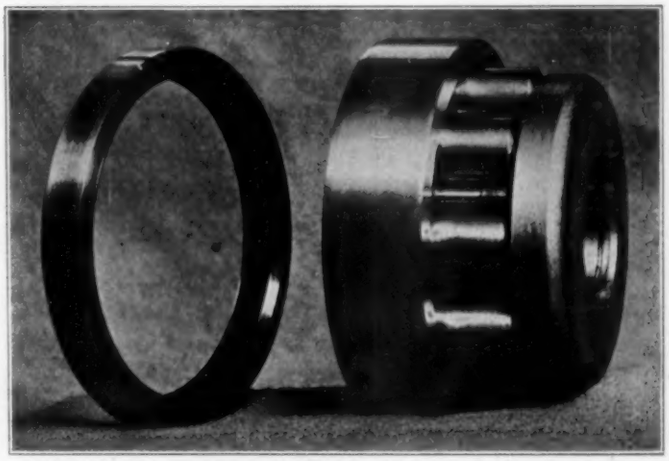
A R B

Highest Award Nat'l Export Exposition Philadelphia, 1899

ROLLER BEARING AXLE

COMBINED JOURNAL AND THRUST BEARING.

Single Bearings for Automobile Driving Axles, Motor Bearings Etc.



Wheels Complete with Roller Bearing Hubs Built According to Specifications

SINGLE BEARING,
showing outer race partially withdrawn, and bevel thrust ring.

We give a Year's Guarantee on Every Bearing, Covering Defects of Breakage or Wear

European Branch
17 Soho Square
London, England

AMERICAN ROLLER BEARING COMPANY
Offices and Factory, 32-40 Binford St., - Boston, Mass.

Visit us at
Pan-American Exp'n
Buffalo, 1901

For Business "Riker" Automobiles For Pleasure

Branches

H. M. LIPPINCOTT
Stephen Girard Bldg.
Philadelphia, Pa.

DETROIT RIKER AUTOMOBILE CO.
253 Woodward Ave.
Detroit, Mich.

MOTOR CYCLE AND VEHICLE CO.
Washington, D. C.

STATION CAB FOR PUBLIC SERVICE.

Branches

FRED. WARD & SON
48 Fremont St.
San Francisco, Cal.

APGAR & DICKINSON
135 East State St.
Trenton, N. J.

EDWARD GUNSTER
Wilkesbarre, Pa.

Main Office and Works
Elizabethport, N. J.
U. S. A.

Riker Motor Vehicle Co.

New York Office, Salesroom, Storage and Repair Station
104-106 W. 39th St.

Columbia AUTOMOBILES

ELECTRIC GASOLINE

Now in the Sixth Year of Service

Twenty-five Standard Types of Pleasure and Touring Carriages, Transportation Conveyances and Delivery Wagons.

FORTY MILES ON ONE CHARGE.

Length of operation and excess of sales have established a reputation for Columbia Automobiles which must appeal more strongly in the selection of an automobile than a recital of claims unsupported by the practical achievements of a time-honored service.

The endurance of the new, long-distance batteries with which Columbia pleasure vehicles are equipped, opens a much more extensive field of service for the perfected electric automobile. Safety, reliability, freedom from noise, vibration, odor and dirt, and the ease with which it can be operated by man, woman or child, make the electric vehicle the ideal conveyance between points of local proximity.

Electric Vehicle Company Hartford, Connecticut